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ORTHODONTIA—SAFE AND SANE*

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IT IS well recognized today that the interests and objectives of the dental and medical professions are identical. Their common interest is the establishment and maintenance of public health. In order successfully to carry out their mutual objectives it is of prime importance that there should be a better understanding on the part of each of these professions regarding the problems and limitations of the other. In the past two decades there has developed within both professions, it seems, a tendency toward overspecialization, with the result that quite often the specialist, because of inadequate training and limited vision, can see only one angle of the health problem. He may see only a part of the individual and sometimes forgets to look at the organism as a whole.

The purpose of this paper is to present a better understanding of the specialty of orthodontia. In order to do this in such a short period of time it is evident that much which might well be said must necessarily be eliminated. No attempt will be made, therefore, to present in detail the numerous problems confronting the specialty, but rather it shall be my purpose to try to give an understanding of some of the problems and limitations of orthodontia in a general way.

DEFINITION OF ORTHODONTIA

Orthodontia is that science which deals with the correction of the malfunction of the teeth and their supporting structures. To the laity it means simply the straightening of the teeth. To the average medical and dental practitioner orthodontia is a problem in mechanics. It is true that mechanics plays an important part in the specialty, but, if one is to practice orthodontia successfully, the basic principles which govern one's procedure must be founded upon biology

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and many of its allied sciences. If orthodontia could be practiced using only the principles of mechanics, there would be few trying problems within the specialty. Failures would merely express the limitation of mechanical ingenuity, and treatment could be reduced almost to zero. Any individual of average intelligence can be taught to move teeth, because most teeth will move if pressure is exerted upon them at any age in the patient's life cycle; but the moving of teeth plays only a small rôle in the treatment of malocclusion—when and where to move them and how to keep them in alignment are of major importance. When cases do not respond to treatment or when relapses occur after treatment has been discontinued, even though the best known mechanical methods have been used, then one certainly should be convinced that there must be some other factor or factors than mechanical ones to be considered. The investigation of these factors brings one into the fields of heredity, pediatrics, psychology, endocrinology, surgery, diet, etc.

The orthodontist, like the pediatrician, the psychologist, the endocrinologist, the surgeon, and the dietitian, should recognize that no two cases can be treated exactly alike and that responses to treatment will vary. To make a diagnosis and prognosis properly, the orthodontist must recognize that the individual is the product of all that has gone before and that growth and development cannot be stimulated at will by the use of mechanical appliances. He must take into consideration the relation of the individual to society as a whole. He must not forget that the glands of internal secretion, a poorly balanced diet, or a possible unknown systemic condition may be working against his treatment.

BENEFITS OF ORTHODONTIA

After having defined orthodontia as the science which deals with the correction of the malfunctioning of the teeth and their supporting structures, it may now be asked what some of the actual benefits are which may be secured from orthodontic treatment.

The mandibular teeth bear a definite relation to the maxillary teeth; and when deviations from the normal occur, functional disturbances may appear, or an unsightly set of teeth may result. If the jaws and teeth are not functioning efficiently, it is evident that there will be improper mastication of the food. If the food is bolted, it cannot be thoroughly digested and poor digestion may bring endless trouble. If the irregularity of the teeth is unsightly, it may affect the whole life of the individual. It is not necessary to tell how important is a perfectly aligned set of natural teeth which function properly. To illustrate what poorly aligned, protruding teeth may mean to an individual socially, it might be appropriate to relate a case in my practice. A mother brought her boy for orthodontic consultation. He was ten years of age and had prominently protruding maxillary teeth. The mother complained that the other children were in the habit of calling the child "Goofy." Children are often cruelly frank; in this case the name they had given the boy seemed rather appropriate. His facial expression was stupid, and his enunciation was poor. He was willing to play with the other children if only they would refrain from calling him horrible names. Within two years after orthodontic treatment was

started, this boy's life changed for the better. His facial expression and his speech were much improved. The children had discontinued calling him Goofy; his school work had improved; in fact, his whole morale was raised.

While a good portion of this boy's improvement was directly due to orthodontic treatment, another good portion was psychologic in nature. On various occasions during the course of his treatment, time was taken to talk with him about his school work and about his relations with other children. At such times an attempt was made to help him in correcting some of his speech defects by getting him to enunciate more slowly and correctly. Suggestions were made which might help him overcome the self-consciousness brought about by the fear of ridicule by his schoolmates. In time there was a marked improvement in the boy as an individual, as a result of the fact that he was treated as a whole and not simply as another set of teeth to be put into position.

WHEN TO TREAT AND DURATION OF TREATMENT

Perhaps some of you have had unhappy experiences with orthodontia. Some of your children perhaps have been under prolonged treatment and have visited the orthodontist weekly from the time they were four and a half until they were sixteen years of age. This, of course, has been unfortunate. The question "When should orthodontic treatment be started?" cannot be answered by giving some chronological age. Each patient, being a case unto itself, must be examined and diagnosed separately. In my opinion orthodontic treatment of any kind should only very rarely be necessary before the eruption of the permanent teeth. There are a few types of cases, however, which should be treated when the deciduous teeth are still in position. If it should be necessary to treat at so early an age as six or seven years, the duration of treatment should be very short. The correction should be made in a few months, the working appliances removed, and the case allowed to develop unhampered by unnecessary wires. The case, however, should be kept under observation by having the patient return every four months. If further treatment is indicated at some future date, appliances can again be placed. Generally speaking, then, if it is absolutely necessary to start treatment at as early an age as six or seven years, the active treatment should be intermittent over the developmental years, rather than continuous and tiresome. In my practice over a period of eleven years, about 95 per cent of my patients have been between the ages of nine and fourteen years. When there have been no pernicious habits and no known systemic disturbances, the duration of treatment has been, on the average, somewhere between one and two and one-half years of active treatment.

HABITS

Some of the most trying cases to treat are those in which there is associated a pernicious habit. These habits, which make orthodontic treatment a failure unless they are corrected, are thumb and finger sucking, lip biting, tongue biting, tongue protrusion, finger nail biting, mouth-breathing, pulling of a handkerchief between the teeth, and thrusting the mandible forward in a pugnacious way.

It has been found that few or no permanent ill effects are suffered from thumb sucking provided the habit is broken before the child is four years of age. If the habit is persisted in beyond this age, the premaxillary region quite often, but not always, becomes badly distorted. The correction of thumb sucking in infants can be accomplished by various means, such as the use of an aluminum mitten, the application of ill-tasting medicine to the thumb which is sucked, or the placing of a small wood splint on the arm in such a position that the hand cannot reach the mouth. The habit should be corrected as quickly as possible, for if it persists into early childhood it usually is very difficult to correct. I have, however, been able to appeal successfully to a seven-year-old youngster's pride. Examples of hideous cases of malocclusion are shown the patient, and then he is informed that if he does not stop the habit he will look like the case shown. In a few instances this has stopped thumb sucking in forty-eight hours. One of the essential points to remember is that the cooperation of the child is most important in the breaking of any habit. If an appeal to the child's pride does not bring results, some mechanical apparatus such as those used for infants may be necessary and helpful. When such habits persist into childhood, a general physical examination is recommended to try to discover whether there is any physical reason for their formation or continuance. Here again I should like to call attention to the fact that all the mechanical appliances in the world and all appeals to pride may not be able to stop a case of thumb sucking if the cause of that thumb sucking is some psychologic or emotional disturbance in the child's life. If his life is spent in an environment of emotional upheaval and insecurity, where there is friction between parents, for instance, or if he is deprived of the amount of love and affection requisite to his nature, he may, and often does, resort to his thumb as a source of consolation and comfort.

Another difficult habit to correct is mouth-breathing. Before attempting to correct the habit, the patient should be referred to the laryngologist for a thorough examination. If tonsils, adenoids, deflected septum, or any malformation is inhibiting free breathing, such abnormality should be remedied before orthodontic treatment is begun. After all apparent inhibitions to free breathing have been removed, it is advisable to have the patient practice proper deep breathing exercises. Also, during sleep, some means should be used to keep the lips closed. Permanent correction of malformation and malocclusion of the jaws and teeth of mouth-breathers cannot be made unless the habitual mouth-breathing is stopped.

CAN ADULT CASES BE TREATED SUCCESSFULLY?

Some types of adult cases can be corrected successfully provided the orthodontist has the absolute cooperation of the patient. After treatment has been discontinued, it may be necessary to retain the case with some mechanical appliance for a long period of time. Adults usually are fussy. They are liable to magnify every little annoyance, whereas the child plays and forgets his trouble. Consequently, adults do not make the best orthodontia patients.

OTHER VARIATIONS AND CONDITIONS

Usually when the labium frenum muscle is extremely thick and definitely extends into the palatal portion of the mouth, there is a marked separation of the two maxillary central incisor teeth. The common method used to correct this condition is to remove by surgery or cauterization the portion of muscle which lies between the teeth and then mechanically to bring the teeth together. It is interesting to note that many times the teeth, after having been moved together and retained for a long period of time, do separate and return to the original position in the jaw when all retention wires have been removed. It is impossible to say why these teeth return to their former positions unless it is because the physiologic position of the teeth is just the same as Nature had originally placed them.

When jaws are accidentally fractured, some of the teeth may be pushed out of alignment. The proper approximation of the fractured parts and the realignment of the teeth can be obtained with the aid of some form of an orthodontic appliance.

The oral surgeon, the plastic surgeon, the orthodontist, and the general dentist cooperating can change the repulsive appearing cleft palate persons into very respectable looking individuals. In some cases the orthodontist, by means of mechanical appliances, can reshape the palate by moving the bones and teeth, thereby giving the oral surgeon a better field for operation and also giving the general dental practitioner a better case for restorative dentistry.

SUMMARY

Emphasis should be placed on the following points:

First, orthodontia should be based upon a thorough knowledge of the principles of biology together with a good working knowledge of mechanics.

Second, all diagnoses and prognoses should consider heredity, environment, natural growth and developmental processes, and individual variations.

Third, each patient is a case unto itself and, generally speaking, active orthodontic treatment should not be started too early in life.

Fourth, most adult cases and habit cases can be successfully treated provided the orthodontist has the cooperation of the patient.

Fifth, in some cleft palate cases orthodontic treatment can be a great adjunct in preparing a better field for the oral and plastic surgeons.

Sixth, often orthodontic treatment is empirical, but that empiricism need not deter the profession from doing a great service to mankind if diagnosis is seasoned with good common sense.

DIAGNOSTIC EXAMINATION OF ANOMALIES IN CASES OF UNILATERAL DISTOCCLUSION OR OF CROSSED BITE*

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IN ALL the realms of practical orthodontia a remarkable development has taken place in the postwar years. The principle of the three-dimensional analysis of the denture is generally recognized today, though divergencies of opinion still exist regarding the methods of orientation of the cast upon its base. The sequence of operations for completing the diagnostic examination by the analysis of the model has already led to a certain systematic process, making it possible to assist the practitioner in his diagnostic examinations by means of printed treatment booklets.

It might, therefore, be assumed that essential problems concerning the metric estimation of the relations of the jaws hardly exist, and that for examinations of all practical importance a clear and comprehensive method has been given, upon which the orthodontist can rely when dealing with concrete cases. This opinion is, however, doubtless incorrect. Daily, questions crop up for which we have no answer ready. More and more the conviction deepens that orthodontia is not solely a matter of malposition of the teeth and of malocclusion, but that consideration of the relation of the denture to the facial skull plays a decisive part, not only in diagnosis but also in treatment. It is well known that all the interest in diagnosis centers on the question of the nature of the malocclusion in each case, and thus in the decision as to which treatment should be carried out for the correction of a distocclusion or mesiocclusion. There is hardly any doubt that a dogmatic decision, as, for instance, the law of the constant position of the maxillary first molars by Angle, or the biometrical orbital canine law by Simon, cannot lead to a satisfactory solution here, but that the biological genetical and, last but not least, the esthetic points of view demand careful consideration.

It is not my intention, however, to occupy myself here with this important question of orthodontic diagnosis, but I wish to deal with a subject which until now, strange to say, has received but little consideration. I mean the diagnostic examination of anomalies with asymmetries in sagittal and transverse directions. As the principal types of such anomalies, I would mention unilateral distocclusion and cross-bite cases.

It is well known that symmetrical malposition of the teeth and malformations of the jaws are much more easily determined with regard to kind, direction, and extent than asymmetrical ones. These diagnostic difficulties run parallel with the difficulties of treatment, the special need for stationary anchorage so necessary in asymmetrical movements. Even the examination of a simple case of "bilateral asymmetrical compression" demands the use of special appliances

*Read at European Orthodontological Society Meeting at Paris, May, 1933.

(square millimeter celluloid sheet, parallel sliding-needle compass and especially of the symmetrograph, so as to ascertain by projection the distance of the side teeth from the raphe median plane, instead of the simple compass measuring which suffices for the measurements of jaw compression in symmetrical conditions). The diagnostic examination is considerably complicated, due to the fact that asymmetrical sagittal or transverse anomalies of the denture, such as unilateral distoclusion which can be coupled with the most divergent forms of orthodontic anomalies, as for instance crossed bite, can be located in either or both dental arches and farther still in the body of the jaw. For obvious reasons the mandible, being movable, will be affected to a greater extent than the maxilla, though the latter, through unilateral difference in growth, can contribute also to the formation of transverse and especially sagittal asymmetry of the teeth.

Strange to say, these asymmetrical deviations have aroused until now but little interest, and only seldom has attention been drawn to the particularly important examination of full face photographs, as Izard did for instance in his textbook.

If we turn our attention first of all toward unilateral distoclusion, when observing the patient's face from in front, we are struck by the lateral deviation of the lower part of the face, absolutely parallel with the existing unilateral distoclusion (Figs. 6 and 9). There is nearly always a deviation of the lower middle line of the denture (middle line between $\overline{1|1}$). This deviation of the middle line is to be considered as a sign of sagittal asymmetry of the mandibular alveolar process or the body of the mandible, where the shifting of the anterior teeth is caused neither by extractions nor by a crowding of the anterior teeth.

If one tries to elucidate the specific character of this deviation, one meets with difficulties at once. It is a general practice, which is also taught by all modern orthodontic textbooks, to project the maxillary median plane on to the mandibular model for metric examination of the mandibular dental arch. The so-called raphe median plane is determined, as is well known, either by three points on the posterior fixed portion of the raphe, or, on the gnathostatic model, by two points of the raphe and the perpendicular to the ear-eye plane. This measuring basis is reliable in practice for determining the conditions of the maxillary dental arch, but if it be projected on the mandibular model with help of the symmetrograph, a measuring basis so obtained does not permit a very delicate differentiation of the transverse and sagittal asymmetries of the mandible. And for the following reason: the mandible, on account of its articular union with the maxilla, can be displaced unilaterally *in toto* in a sagittal or transversal direction, thereby increasing or diminishing the existing alveolar maxillary or mandibular deviations.

Only the analysis of the full face photograph, neglected until now, allows us to take a further step forward. Typical deviations of the median points of the lower lip, the soft parts of the chin, and the gnathion all point to a unilateral shifting of the entire mandible. The nature of these deviations may be determined by measuring the distances from the median points of the lower face to the tragon and the length of the horizontal and ascending ramus. Serial observations on patients with unilateral distoclusion have proved that, very often if not

always, the dimensions are diminished on the side of the distoclusion, and especially the sagittal dimensions, as: tragion-infradental, tragion-gnathion, and gonion-gnathion. The angle of the mandible itself rarely shows any essential differences.

One cannot doubt, therefore, the importance of the mandible in many cases of unilateral distoclusion. The question remains still unanswered, whether a similar or contrary alveolar deviation of teeth may exist at the same time apart from the mandibular deviation—which can naturally be located not only in diminished dimensions of the corresponding side, but also in a displacement of the mandible at the joint. As already mentioned, the analysis of the model in relation to the raphe median plane can be of no help. No deviation of the mandible determined in this manner by projecting the maxillary median plane on to the mandibular model is simple and evident in its character, but it comprises a number of different deviations. If one tried to ascertain the transverse and sagittal symmetry in the mandible by drawing transverse lines to this median line, one would be led to totally erroneous results.



Fig. 1.

These facts point to the necessity of a special and particular median plane of the mandibular dental arch. It is clear that the difficulties which arise in the determination of this special median plane in the mandible are far greater than in the determination of the median plane in the maxilla by means of three points of the raphe. Nevertheless, one finds enough fixed points to come to a practically sure determination of the lower middle line. Suitable fixed points are provided by the frenum linguae and the frenum of the lower lip, but one must keep in mind that very likely a simultaneous shifting of the incisors may exist, resulting from premature extraction or narrowness, which must be taken into consideration. One must try, when taking the impression, to mark the frenum linguae as well as the frenum of the lower lip clearly, so that their insertions on the labial fold of the mucosa and on the floor of the mouth will be clearly visible.

When the impression tray is placed in the mouth and before the impression material is hard, one pulls the lower lip forward and then upward, and while the tray is kept firmly in position, the patient is made to raise the tongue by saying "L," so that the tip of the tongue touches the most distal point of the center of the palate (Fig. 1). It is advisable to practice this movement a few times with the patient before taking the impression.

If, with the help of these points, one now draws the mandibular median plane (Fig. 2) and possibly with the help of three points, or at least two points and the vertical relation to a horizontal plane (ear-eye plane) or occlusal plane, according to the orientation of the model under examination, one very often finds variations in the direction of the mandibular median plane as compared with the maxillary one, which point in a very characteristic way to deviation of the mandible in relation to the maxilla, and which complete to a really valuable extent the results obtained by the examination of the full face photograph.

The conditions of a practical case will illustrate this point clearly.

In young W. F., thirteen years of age (Figs. 3-6), there is "narrowness with frontal crowding and left-sided distoclusion." The nature of this unilateral malocclusion must be explained. If in this case one draws the mandibular special median plane in relation to the frenum linguae and that of the lower lip, a distinct shifting of this median plane toward the raphe plane is made clear.

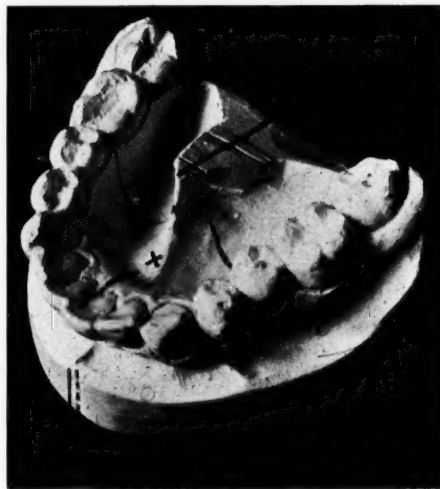


Fig. 2.

This shifting points to anomalies of the mandible in the size of the rami of the jaw or in a change of position in the joint. Therefore the median plane of the mandibular dental arch shows a deviation from the raphe median plane, which is distinctly recognizable by the fact that it shows a somewhat stronger deviation on the anterior surface of the model than on the posterior part (Fig. 5). This kind of difference may be easily explained by the mechanism of this unilateral deviation of the mandible. The shifting of the mandibular median points of the face toward the left side on the full face photo can be explained in a similar way.

This mandibular median plane also presents this advantage, that not only the shifting of the whole mandible but also the alveolar shifting of teeth in the mandibular dental arch can be determined. If one draws lines transverse to this middle line, one can easily obtain the relative proportion of any sagittal or transverse asymmetries.

In the first case demonstrated there were no essential transverse and sagittal deviations. There was full symmetry in a sagittal direction, a sign that here

only unilateral, purely mandibular retrusion existed. This is, however, not always the case.

In the case of U. B., seven years old (Figs. 7-9), the mandibular side teeth on the side of the distoclusion are more distal than the same teeth on the other side. Consequently, there is a sagittal asymmetry of about 2 to 2.5 mm., which increases the shifting of the entire mandible. There is, therefore, a combination of unilateral mandibular retrusion with a unilateral mandibular alveolar retrusion. In this case, also, the unilateral mandibular deviation may be recognized by the shifting of the mandibular median plane in relation to the raphe median plane, toward the side of the distal occlusion, just as the similar shifting of the median points of the lower face on the full face photograph. The change of position of the mandible in relation to the maxillary may be explained by a shortening of the horizontal ramus (on the right side the measurements are somewhat smaller than on the left) and by a distal displacement in the joint.

Without doubt, the principal share in such deviations, as in the case of unilateral distoclusion, may be localized in the mandible. A reason for this is the greater facility of displacement of the mandible on account of its articular movement. An exception to this rule is found in cases where a traumatic influence, as for instance long years of thumb-sucking, has led to a mesio-sagittal shifting of teeth on one side of the maxillary dental arch, but without affecting the mandible. Such is the case of open-bite in a fifteen-year-old girl (shown in Figs. 10 and 11) in which a unilateral sucking habit was still indulged in at this advanced age, and caused the localization of the distoclusion—on the right side—only in the maxilla. From this type of open-bite deformity, due to the finger being sucked, it is shown that the distoclusion is doubtless a consequence of the sucking habit, i.e., a mesial shifting of the right maxillary side teeth. The model analysis by the study of the symmetry, shows just such a protrusion of the maxillary right side teeth, and moreover conformity of the mandibular and the maxillary median planes; therefore, no unilateral mandibular deviation. There is also sagittal symmetry of the mandible as related to its particular mandibular middle line; a unilateral mandibular alveolar deviation can be excluded likewise.

Also in the cases with unilateral distoclusion, where obviously corresponding deviations of the mandible are present, be it the shifting of the entire mandible or the displacement of the teeth in the alveolar process, it is advisable to search for any possible unilateral deviations of the maxilla, as these belong to the symptom-complex of the unilateral malocclusions here under discussion. The participation of the upper maxilla is in general rather hard to ascertain, but indications are given in this respect by asymmetries of the middle part of the face, unilateral differences in the growth of the zygomatic arches, shifting of the median points of the soft parts, as, for instance, the point of the nose, sagittal asymmetries in the position of ears, etc.

That such occurrences are far from rare is proved by my examination of the skulls in the Anatomy Institute of Bonn, among which I found quite a number of such cranial asymmetries. They are found mostly with a definitely rhomboid-shaped head, where the zygomatic arches and also particularly the forehead are more developed on one side than on the other, while the back of the head is on

the contrary flattened. Here also the external auditory meatus, the zygomatic arches and their processes, as well as all teeth of the respective side, are mesial to normal.

I was able to ascertain similar evidence in a pair of uniovular twins of about twenty years of age, where in a mirrorlike conformity asymmetries of the middle and lower parts of the face were to be found which had led to the origin of unilateral distocclusion.

The study of sagittal and transverse symmetry brings proof of the deviation in the maxilla, so far as it is related to the share of the maxilla in the existing unilateral distocclusion, but without any possibility of ascertaining exactly the share of the body of the jaw and that of the maxillary alveolar process on this deviation. Even if this point could be ascertained with precision, it would have only a theoretical value, as the treatment has to confine itself to the maxilla, to movement of the teeth in the alveolus, owing to the impossibility of influencing directly the shaping and the growth of the skull of the middle face.

With the first two cases described, the measurements of the maxillary models resulted every time in a sagittal asymmetry, and in such a way that the teeth on the side of the distocclusion stood 1 to 2 mm. more mesial than the same teeth on the other side.

SYNOPSIS

Summing up, one can therefore state: An asymmetrical sagittal deviation, such as unilateral distocclusion, can be localized in the maxilla and the mandible, in the body of the jaw itself, and in the alveolar process. It is very difficult to allot to each of the two regions in the maxilla its responsibility in these deviations. However difficult this may be, practically it is of no great value, as it is impossible to exercise a direct therapeutic influence on the body of the maxilla.

All the more important, therefore, is the exact explanation of the conditions in the mandible. Here with the help of the construction of a special mandibular median plane, a measuring basis must be created which, in spite of all the mobility of fixed points (*frenum linguae* and *frenum labii*), will permit us to differentiate between alveolar and mandibular deviations. The shifting of the mandibular median plane in relation to the maxillary one points clearly and undoubtedly to the change of position of the mandible with its freely movable joint. The careful analysis of the full face photograph demonstrates the part played by the body of the mandible by the shifting of the median points of the lower part of the face, and should therefore be practiced more often than heretofore. Measurements of sagittal dimensions of both sides can assist the examination.

The differentiation of the symptoms in the mandible is without doubt of great practical value, as the methods of treatment are also different for each variety of deviation.

After these fundamental explanations, let us now turn to the findings of the three described cases of unilateral distocclusion. The diagnostic examinations of the models and of the photographs give the following results.

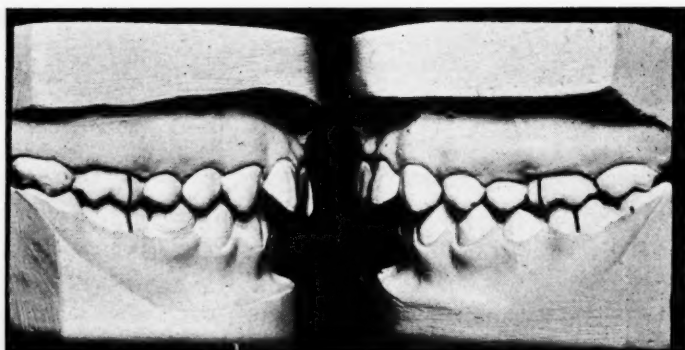


Fig. 3.—Case 1.

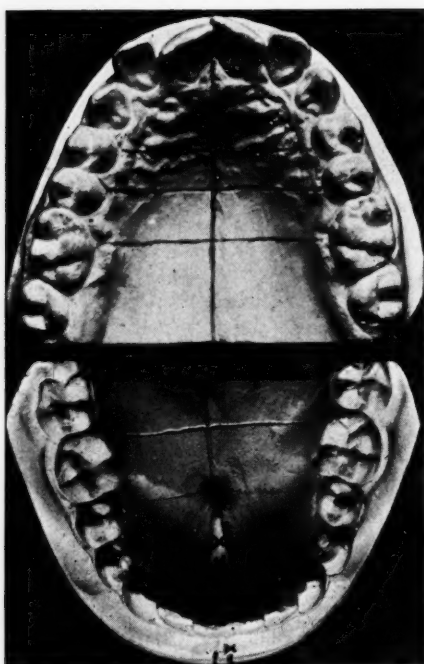


Fig. 4.—Case 1.

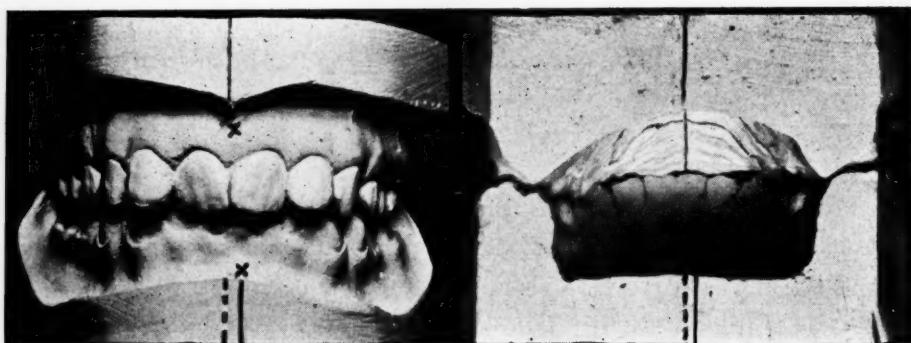


Fig. 5.—Case 1.

CASE 1.—W. F., thirteen years of age (Figs. 3-6).

Maxillary narrowness with anterior crowding and left unilateral distoclusion. Sagittal asymmetry in the maxilla: the teeth on the left side (on the



Fig. 6.—Case 1.

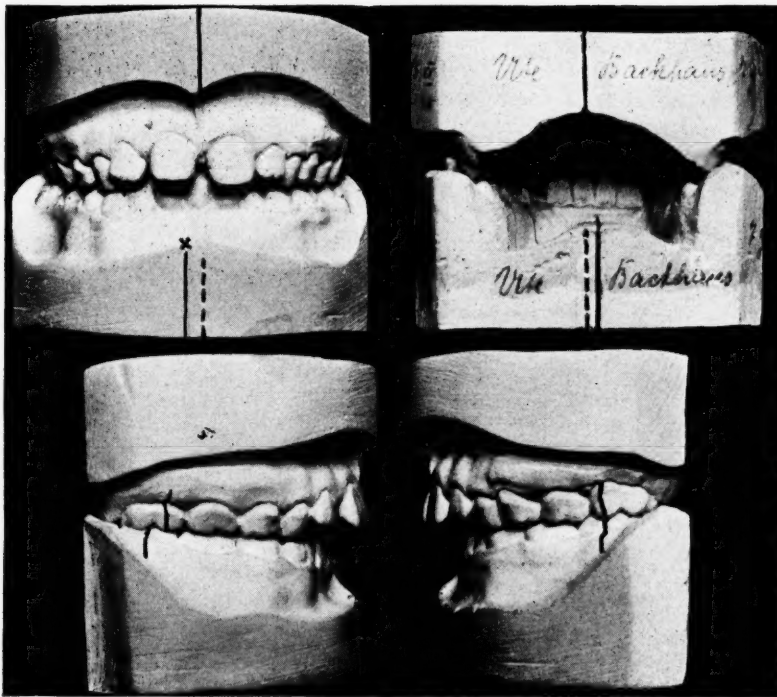


Fig. 7.—Case 2. Seven years; unilateral distoclusion on the right. Shifting of the mandibular median plane to the side of malocclusion. Unilateral mandibular retrusion.

side of distoclusion) are 1 to 2 mm. more mesial than those on the other side. Important asymmetries of the middle face which cannot be ascertained; apparently therefore "maxillary alveolar unilateral protrusion."

In the mandible, shifting of the special mandibular median plane in relation to the raphe median plane, therefore unilateral mandibular retrusion. Shifting to the left side of the median points of the lower face on the full face photograph. No sagittal asymmetry in the lower arch, therefore no unilateral alveolar deviations.

Finding.—Unilateral maxillary protrusion, unilateral mandibular retrusion on the side of the distocclusion.

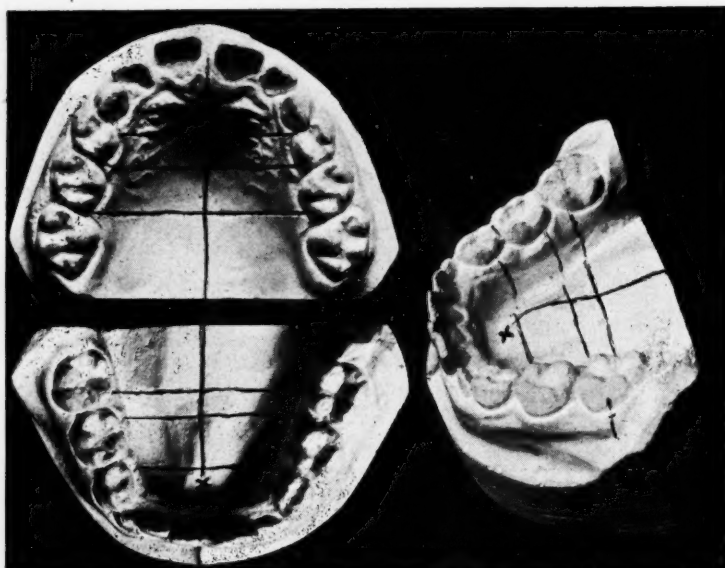


Fig. 8.—Case 2. Unilateral protrusion of the maxillary right side teeth. Unilateral retrusion of the mandibular right side teeth. Both alveolar anomalies.



Fig. 9.—Case 2.

CASE 2.—U. B., seven years of age (Figs. 7-9).

Maxillary compression with finger-sucking protrusion and right-sided distocclusion.

In the maxilla, sagittal asymmetry of 1 to 2 mm.; the position of the maxillary teeth is more mesial on the side of the distocclusion.

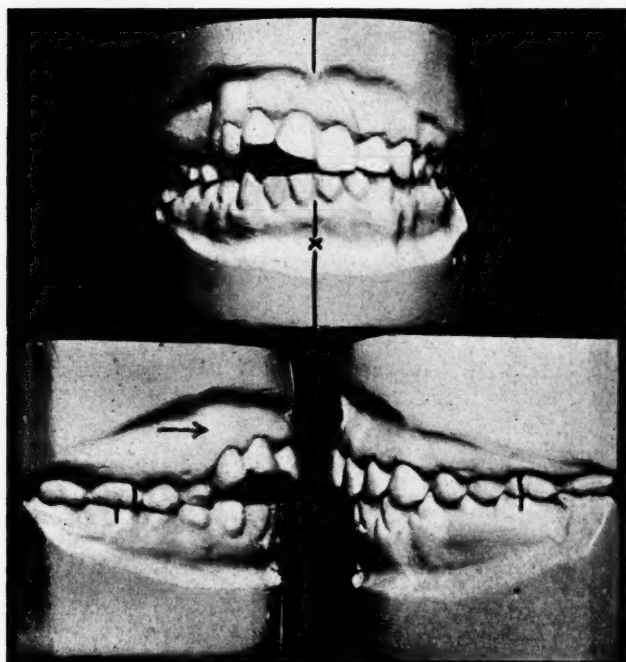


Fig. 10.—M. N., fifteen years; unilateral open-bite by thumb-sucking. Unilateral distoclusion on right side, localized in a unilateral protrusion of the maxillary right teeth.

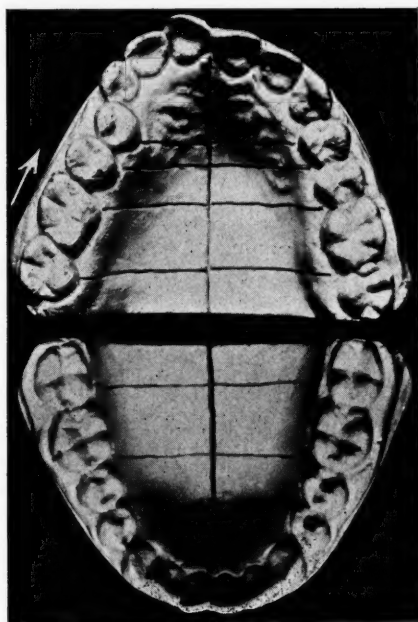


Fig. 11.—Case 3.

In the mandible, shifting of the mandibular median plane toward the side of the malocclusion; furthermore, also sagittal asymmetry of 2 to 2.5 mm., measured on the special mandibular median plane (on the side of the distoclusion the mandibular side teeth have a more distal position).

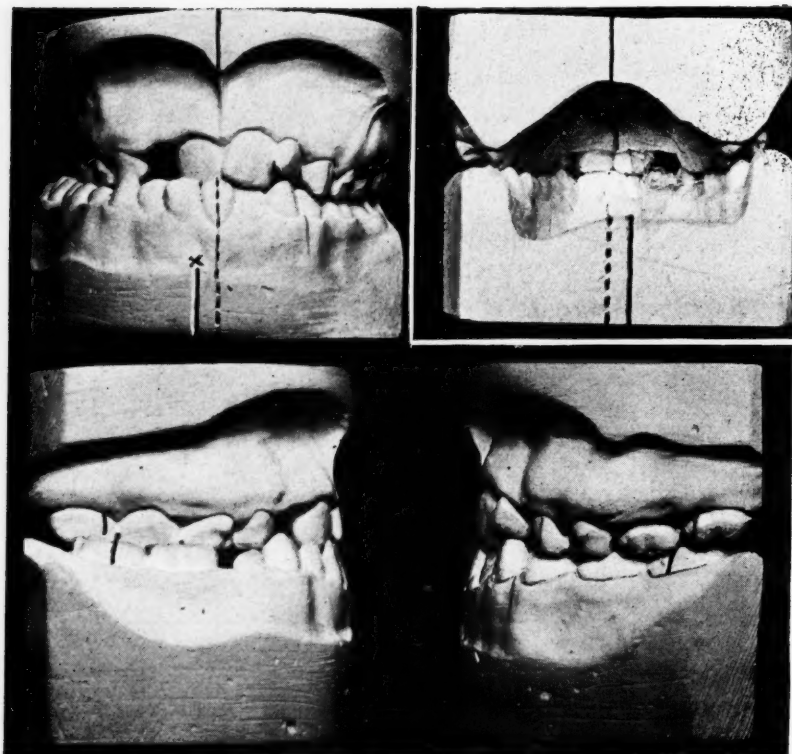


Fig. 12.—Case 4. W. A., nine years; unilateral crossed bite on the right.

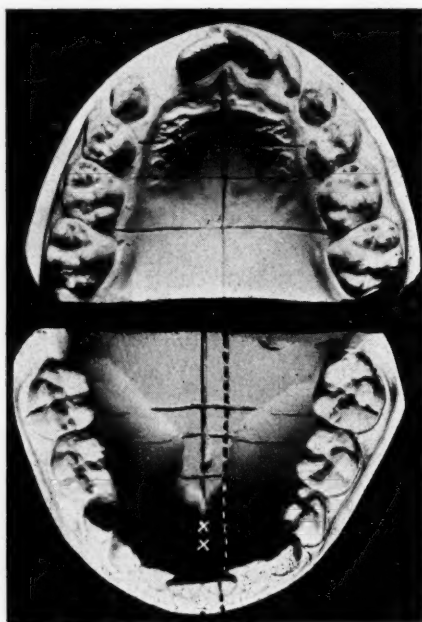


Fig. 13.—Case 4.

Finding.—Unilateral maxillary alveolar protrusion, unilateral mandibular alveolar retrusion, unilateral mandibular retrusion.

CASE 3.—M. N., fifteen years of age (Figs. 10, 11).

Unilateral open-bite, caused by finger-sucking, with unilateral distocclusion.

Sagittal asymmetry in maxilla and especially unilateral protrusion of the maxillary teeth on the right side. Conformity of maxillary and mandibular median plane. Sagittal symmetry in mandible.

Finding.—Unilateral maxillary alveolar protrusion.

In exactly the same way, yet with still greater evidence, the necessity of such a diagnostic examination shows itself in a unilateral transversal malocclusion with crossed bite. By this is meant, the malocclusion characterized by the fact that on one side the maxillary side teeth do not occlude buccally to the mandibular, but that the reverse condition is present; in one place the occlusion changes, "crossing over" to the normal occlusion of the front teeth.



Fig. 14.—Case 4.

Likewise, in unilateral crossed bite malocclusion, the necessity of establishing a special mandibular middle line is apparent, as this line makes it possible for us to give full particulars about the localization of the unilateral transverse deviation. Fundamentally, the unilateral crossed bite can be brought about by:

(a) A transverse asymmetry in the maxilla, i.e., a relative narrowness on the side of the crossed bite.

(b) A transverse asymmetry in the mandible, i.e., a relative expansion on the side of the crossed bite, and

(c) A transverse shifting of the mandible *in toto* in the joint.

These factors can be present separately or together in all possible combinations.

The share of the maxilla can be ascertained without any difficulty by examining the transverse (and sagittal) asymmetry. One proceeds in the mandible in a similar way, considering it, however, naturally in relation to the mandibular

median plane. This plane, by its displacement in relation to the raphe median plane, indicates any change of position of the mandible in the joint (Fig. 13). This shifting, however, as compared with that found in a unilateral distocclusion is more parallel, corresponding to the displacement of the mandible, which is nearly exclusively transverse. This transverse displacement of the mandible in the joint brings about a more or less marked displacement of the median points of the lower face toward the side of the crossed bite (Fig. 14).

CASE 4.—W. A., nine years of age (Figs. 12-14).

Unilateral crossed bite on the right side.

Slight transverse asymmetry, but the greater compression exists just on the opposite side to the crossed bite. In the mandible there is transverse asymmetry if one considers the mandibular middle line. Considerable deviation of the mandibular middle line in relation to the maxillary one, and running in an almost exact parallel in the transverse direction. The median points of the lower face are shifted toward the side of the crossed bite. Fundamentally, the crossed bite of this case represents a transverse shifting of the mandible, which is finally brought about or at least favored by the relatively narrow maxilla.

Finding.—Right-sided transversal shifting of the mandible.

MALPRACTICE

PERCY NORMAN WILLIAMS, D.D.S., TUCSON, ARIZ.

AMONG the many problems with which the members of the dental profession have to contend during a depression is the possibility of a suit for malpractice. The large number of suits which have been instituted during the past two years brings home to us the disquieting fact that any day we may face this destructive force to our reputation.

In an editorial in the October, 1934, issue of the *Dental Cosmos*, we read, "Dental lawsuit epidemics seem to run in cycles coeval with depression cycles, and correspondingly in degree therewith. The less means some people have for providing necessities, as well as luxuries, the more willing and eager they seem to be to avoid professional obligations; and this in a large measure is responsible for the institution of many lawsuits against professional men. In other words, the device of a lawsuit is used as a subterfuge to procure money from the dentist or to avoid payment of just debts." Further on the editor states, "However, there is another aspect to the case aside from the purely financial liability. The institution of a lawsuit regardless of the outcome can well be a source of loss of prestige which the younger practitioner at least may find it exceedingly difficult to recoup."

While the contemplation of a suit against us for malpractice is something from which we would naturally shrink, we must face such a possibility and consider ways and means to meet and combat it.

Perhaps one of the things which may help to ward off a malpractice suit is absolute honesty with our patients at all times. There are certain details in our work which the patient has no right to know, chiefly because he could not comprehend the questions without a dental background. On the other hand, he has a right to know what he may expect from any given operation. He should always clearly understand that we have the biological problem to contend with and that we are not merely tooth mechanics.

The dentist should have such a knowledge of bacteriology, both theoretical and practical, as to enable him to keep his instruments in a sterile condition and do operations in as aseptic a manner as possible. He should have a thorough understanding of the anatomy of the teeth and their surrounding structures so that he may be able to explain to a patient just what tissues are involved in certain oral operations. Under no circumstances should he ever hint at anything suggesting a guarantee for an operation. He should be extremely careful what he leads the patient to believe he may expect from partial and full dentures, and other restorations. Explain that, at best, a full denture is only an effort to restore function, but that no plate, be it ever so well made, can compare in efficiency with the natural teeth.

Read before the Tucson Dental Society, February, 1935.

If you are called upon to extract a tooth and there is likelihood of fracturing a root, explain this in a tactful way to the patient. Win his confidence by honesty and frankness. It may save serious embarrassment later. When there is the slightest doubt about the removal of a tooth, tell the patient that you wish to check the operation with an x-ray examination. If you feel you have done all within your power to remove the tooth and still a fragment remains, you can still gracefully refer the patient to an exodontist with the advice that the case is one requiring a specialist; that you have done your best. A knowledge of psychology, which means understanding human beings, is of great importance in a case like this. A busy general practitioner in a city like this, or larger, rarely profits by extracting teeth. Extractions offer many opportunities for accidents. Then there is the nerve strain for both the patient and the operator. If you could look at your books and consider the time involved, the dissatisfied patient when the operation is not a success, and the low fee when compared with other types of work, you would rarely find extractions profitable operations. Sometimes they become serious liability and may invite suit. Keep a careful record of everything done on a patient. Do not under any circumstances depend upon memory. Include the patient's name and address and any physical symptoms which would indicate that the patient is not in normal health. Have a clear understanding about the fee, preferably in writing. Many suits are instituted because of failure to agree on the cost of work. This has to be settled some time, and it might better be done at the beginning of the work when misunderstandings can be avoided.

In my practice, I send a form letter to every patient giving the cost of the work and the probable time involved. I assume parents come to me with their children because of my standing in the community as an orthodontist. Therefore I should consider it in bad taste to attempt to influence them with any extravagant promises of what I could do for their children. I never knowingly lead a parent to believe that I can accomplish *anything* in the way of tooth movement. I can only point to what has been done, with the comment that there is reason to believe this child will react in a normal way.

The greatest bulwark against malpractice suits is a flat refusal to appear in court against a fellow practitioner. Once a suit is won here by one man testifying against another, an epidemic of suits would follow. Suits are being pressed all over the country. In New York City last year, lawsuits numbered one for every eighteen dentists.

I have no reason to believe any suits are contemplated here, but as Washington said, "In time of peace, prepare for war." A suit against any one of us is a suit against all of us. I quote from William Hyde, October, 1934, *Survey*: "Be careful of your remarks. Criticism of your brother colleague is needless even though in your opinion he does not quite come up to the professional man's standard. At times the procedure of the other practitioner may be extremely annoying to you. For example, one patient presents himself with a set of x-ray pictures. Your examination of this series reveals a gross lack of technique on the part of the dentist. Some of the abscesses do not show and the remaining

teeth are elongated. The question raised: What are you to do? Condemn your brother colleague? By no means. Inform the patient that you personally would like another series of x-ray pictures taken at different angles."

Where does a patient get the idea of bringing suit? He is hardly qualified to pass upon many of the operations in dentistry. There is, of course, some exception to this, but, generally speaking, the patient could not in the majority of cases determine by himself whether or not he had grounds for a suit. Where, then, does he get his information? In a paper read some years ago before the First District Dental Society of New York City, it was stated that over 90 per cent of patients bringing suit at that time received their suggestions either directly or indirectly from dentists. Looking at it any way we like, this is a scathing indictment against members of our profession who hold their relation with their fellow dentists in such low esteem.

I quote again from Dr. Hyde: "No one is immune to lawsuits, and dentists are no exception to this general rule; the practitioner is brought before legal rostrum and is sued for malpractice. Just consider: an individual of unquestioned education, of position in society, and of rank in the healing profession, being bled for money by laymen, being accused of 'deliberately performing his services with malice.' Then, lo and behold, up steps another practitioner, a brother worker, a fellow of the same profession, who smugly announces himself as an authority against the defendant. It is this phase of malpractice with its inhuman coldness, selfishness, and complete disregard of a fellow worker's reputation and standing, that I want primarily to observe and ponder over."

Remember there are potential suits in remarks we may make about another man's work. Make it a policy to speak well or say nothing. A case to illustrate my point is told by W. J. Furrie in the October, 1934, issue of *Oral Hygiene*. "From San Pedro, I have a report of a more recent case. The dentist wanted to help the patient, who did not have much money. The girl is now twenty-two years of age and, after several years of treatment, she came to my office to see if I could complete the work for her. She had a maxillary protraction with a deceptive bite, so that when she closed her teeth for examination, she would protrude the lower jaw until the teeth rested comfortably, and it didn't look bad. The dentist had placed the upper appliance only, and widened the upper arch until the occlusion was fair, with this protrusive bite. During mastication or normal bite, the lingual surface of the upper posterior teeth occluded buccal to buccal surface of lower posterior teeth, with devitalization of four upper anterior teeth, and the posterior teeth were hopelessly loosened. *I used the necessary precaution and explained to her* that I could do nothing for her. She returned with an attorney, and he wanted to sue her dentist for \$30,000 and was sure my testimony would win the case. He pleaded with me, saying the orthodontists should make an example of dentists doing orthodontia. Of course, I refused to testify and so did every other dentist, and the case was dropped."

I call your attention to the last line of that quotation, "and so the case was dropped." In this paper I have purposely avoided considering the legal

aspect of malpractice, as I feel that is a matter with the individual who wishes to become familiar with that phase of office practice and routine. The approach to this question as recited in this paper is, I believe, the more important for our consideration. A man's standing in his community, his reputation for honesty, his interest in civic and religious affairs are all important as a defense against malpractice. I believe we should present a united front in this society against that contemptible class of people who would avoid paying a just debt, against shyster lawyers who would help them, and all others who would invade our field and by hook or crook attempt to split the common bond of professional friendship which exists among us.

THE FACE AS A FACTOR IN HEALTH AND LIFE*

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THE face is our advance agent to the world at large. It is that part of us that meets "the world's eye" and which determines to a very great extent the kind of treatment the world will accord us throughout life. Therefore, if we wish to be viewed with approval, it behooves all of us to show the world the best possible face at our command. Is then the appearance of the face a matter of choice? Have we more than one face to choose from? Is it not something that we inherit from our ancestors and about which we ourselves have very little to say? In order to answer these questions, it becomes necessary that we explain briefly how our face develops. Or, to use a common expression, how we "get that way."

All of us are endowed at birth with certain basic physical and mental qualities which largely determine the degree of growth, development, and physical perfection that our bodies will be able to achieve during life. The course of our bodily growth and development is, however, not so simple. The growing child is continually subjected to a great number of external and internal forces which in turn influence and modify his naturally endowed body pattern. Sometimes these modifications may be beneficial to the child. More often they are harmful and produce disturbances in the form and relationship of the underlying structures of the face, resulting in facial malformations and inharmonies.

The forces which produce these modifying influences on the growth and appearance of the face of the child may express themselves through the amount and quality of the food we eat; the water we drink; the diseases that may overcome us; the formation of habits involving the abuse of facial muscles, the jaws, the mouth and teeth; through accidents, and through our surroundings in general. In short, the general physical development including facial appearance, that people bring into manhood and womanhood, does not necessarily bear any direct relationship to their naturally endowed or, as they are sometimes known, inherited characteristics. We can see, therefore, that if it were only possible to recognize and control the modifying forces responsible for the growth and development of the child's face, we should thereby be able to eliminate many harmful defects and make the appearance of the face a matter of our own choosing.

Fortunately for many of us, we are at present in a position to say with some measure of confidence that most of the modifying forces responsible for the *kind* of growth, development, and appearance assumed by the face can be successfully controlled and their influence either directed to beneficial purposes or,

*Radio broadcast made Dec. 18, 1934, under the auspices of the Oral Hygiene Committee of Greater New York.

if harmful, entirely eliminated. This is possible, however, provided only these influences or modifying forces are recognized in time. The longer they are allowed to establish themselves and to produce their ill effects, the longer will it take to change or eliminate them, if at all. It is in this respect, in the early recognition of harmful influences and in taking steps toward their prevention or elimination, that the mother who is ever alert and interested in the welfare of her child can accomplish a great deal. Young adults can also overcome facial deformities to a great extent, provided they seek and obtain proper information and reliable advice. It is the concern of orthodontists—o-r-t-h-o-d-o-n-t-i-s-t-s—who practice a special branch of dentistry, to deal with the correction of facial deformities as they are produced by badly formed jaws and by irregularly arranged teeth, in their relationship to bodily health and facial appearance.

We are often asked whether successful orthodontic treatment is possible for adults, as well as for children. This can be answered only after a careful examination and study of the individual case and applies equally as well to children as to adults. Successful orthodontic treatment depends on the type of condition to be corrected, the present health and the past medical history of the patient. The age of the patient is a factor, but does not, however, entirely exclude adults from the benefits of orthodontic treatment. The best results, in the correction of facial abnormalities caused by malformed jaws and badly arranged teeth, are usually obtained with children.

In giving our attention to the face in its relationship to health and life, we may well ask: What good is life without health? The answer is self-evident. Life without health is of very little value. The person whose health is bad cannot fully enjoy life, regardless of all appearances to the contrary. A well-proportioned and pleasing face is important to the enjoyment of both health and life. A badly formed or misshaped face may itself be the result of ill health which affected the general growth and development of a person during childhood. The reverse is also true; the physical and mental health of a person may in turn suffer because of an existing facial abnormality.

The ill-shaped, asymmetrical, or malformed face may be the result of localized mouth conditions or of general body disturbances. Among the conditions so responsible we can include faulty diet or improper feeding even when the diet itself contains all the necessary nutritional requirements. For example, bottle-fed babies, if fed through improper milk dispensers, may show facial maldevelopment even if the milk formula itself contains all the necessary food elements. Later, if the child cannot chew his food properly, or if the baby teeth are lost before the succeeding permanent teeth are ready to erupt, facial development may again be influenced. Mouth-breathing, for whatever cause, may make it difficult for the child to breathe normally and may gradually change the muscular development and outward appearance of the face. Sometimes the mother herself will be the last person to notice anything wrong with the child's face. Often she becomes aware that something is wrong with the child's facial development long after the child himself has realized that he looks different from his playmates, and that he is being excluded from their cliques. The greatest crime of childhood as well as in the grown-up world, is to be different

from one's fellows. While we in America believe in freedom, we also demand conformity. Thus, certain styles, games, and fads become popular because of our tendency to conform to the demands of current opinion. Those who are different must be prepared to suffer the consequences. The child whose facial appearance is different from that of his playmates will tend to withdraw from play. He becomes moody, and his physical as well as mental health suffers.

Recently I had occasion to see two young adults. One was a young man whose father is a lawyer and who wants his son to follow the same profession. The boy's teeth are so badly arranged in his jaws that it is impossible for him to close his mouth properly. This gives his face a blank, staring look and makes him appear as though he were mentally deficient, although his level of intelligence is really quite high. Furthermore, his dental condition interferes with his speech. I shall not go into the subject of speech defects caused by irregularities in the arrangement of the teeth at this time but merely wish to call attention to the fact that it has been estimated that almost 26,000 children in New York City public schools alone have speech defects. Many of these defects are without a doubt directly due to dental irregularities and can never be successfully treated until the dental condition is corrected. Proper early guidance would have prevented the condition cited in the boy whose father wants him to become a lawyer, and would have made present treatment unnecessary. It is to be seen then that speech is ever an important factor in success and happiness.

The other case that I have recently seen is that of a girl whose teeth protrude to a great extent. This girl did not become aware of her abnormal condition until quite recently. Although she was graduated from a commercial school and is an excellent stenographer, she is unable to obtain a position. In the first place, her speech is so affected by her dental condition that she cannot be well understood over the telephone. Furthermore, being constantly aware of her abnormality she has developed a feeling of inferiority and easily becomes excited, irritated, and flushed. The harm done by this condition to her health and happiness was getting progressively worse. From an economic standpoint, she had to depend on others for her support. All of you can probably think back to similar cases of which you have known. We have been told many times that sound teeth are important for good health and in facial appearance when smiling. Even in ordinary times, however, people do not wear a continuous smile. While a smile goes a long way, Pollyannas are tiresome and wear on our nerves. It is just as important to appear well when the face is in repose as when one is smiling.

I have here attempted to show that the arrangement of the teeth and the proper development of the jaws have important functions besides aiding us in chewing food and in our appearance while smiling. The jaws and teeth are the underlying factors responsible for good looks and a well-proportioned face. Furthermore, the appearance of the face influences our general health as well as our state of mind. One cannot be happy while conscious of some shortcoming in facial appearance. All of us should take heed and if necessary avail ourselves of the opportunity afforded by modern dentistry through the specialty of orthodontia, and provide ourselves with the best possible face at our command, in order that we may enjoy good health and a happy life.

THE RELATION OF MECHANICS TO ORTHODONTIA*

FRED WOLFSOHN, B.S., D.D.S., SAN FRANCISCO, CALIF.

MALOCCLUSION of the teeth and its treatment have for many years attracted the attention of those interested. The purpose of these pioneers was doubtless one of individual tooth movement performed by the crudest primitive methods without regard to function of the dental apparatus as a whole. From these primitive conceptions and from the application of the crude appliances has developed the modern science of orthodontia which takes into account not only the simple method of moving teeth, but also the fundamental subjects of physics and biology upon which rests the entire superstructure of the science of orthodontia.

Modern orthodontia naturally falls within the province of biology and mechanics. While this is true, and while the major portion of the operative work is mechanical, it must not be overlooked or forgotten that all such mechanical work should be carried on according to biologic principles.

Fundamentally, orthodontia should be considered as a biologic problem. Its practical solution under our present knowledge must be largely mechanical, as indeed it has been up to the present time. Briefly now I wish to give a picture of the present state of our knowledge of the underlying nature of the living tissues with which orthodontists work. By analysis these tissues are found to consist principally of four chemical elements—oxygen, hydrogen, carbon, and nitrogen. In life, these elements combine into extremely complex chemical compounds unlike those that are found elsewhere. The components of the compounds which constitute the formulas of protoplasm are taken into the organism in the form of food, where they are elaborated into living matter. This process requires a certain amount of energy to bring about the chemical combination, and this energy is locked up in the product. In the metabolic activity of the cell this chemical combination is disrupted, and the latent energy liberated, and this is the source of energy required in the process of orthodontia.

This living matter, as stated above, is always organized into cells. It never occurs otherwise. Our present idea of the cell is that it is a mass of protoplasm containing a nucleus, cell membrane, and smaller biologic units. The mass of the protoplasm which we call a cell is organized and is itself a unit. It may live quite alone and carry on the necessary activities of life; ingestion, digestion, assimilation, excretion, and reproduction. Thus it appears that the cell is the structural and functional unit of all living forms, and all manifestations of life are accomplished by the metabolic activity of the cell.

In the organism, cells are gathered into tissues, and a tissue is a mass of cells held together by intercellular substances. The intercellular substance has a twofold function—it acts first as a supporting structure, and second as

*Presented to the American Board of Orthodontia.

a vehicle for the conveyance of substances for the sustenance of the cell. There is a constant reaction between the cell and the intercellular substance. Intercellular substances are formed by the cell in response to a need incident to the relation of the organism to its environment.

The orthodontist's work exerts a modifying influence upon the environment by mechanical means, thus establishing a new balance in the dental arch. The elements which constitute the environment are the tissues immediately acted upon. The versatile character of these tissues makes the necessary modifications possible; they develop and change to meet all the requirements incident to the influence exerted by mechanical means upon the environment. These variations are induced by the production of increased amounts of the intercellular material, its destruction, or the change of its form. The connective tissue has retained its embryonic character and acts as an emergency tissue, being capable of transformation into any elements necessary to meet the exigency of the situation. These mutations of the connective tissue are its most striking characteristic, and illustrate its protean character, and should be thoroughly grasped if the developmental and growth problems of modern orthodontia are to be understood. It is apparent, then, that the intercellular substances have been produced and are maintained by the cells to answer the necessity which arises in consequence of mechanical interference.

The mechanics used to create the new balance in the dental arch should be grouped into two classes: first, the use of forces which do not satisfy the biologic problem should be considered as faulty orthodontic mechanics; second, good orthodontic mechanics is the application of forces which satisfy both the biologic and the mechanical problems involved in tooth movement.

Mechanics treats of the motion of bodies and the equilibrium of forces. It is divided into kinematics and dynamics. Kinematics treats of the motion of bodies without reference to the forces producing these motions, or to the masses moved. Dynamics is that branch of mechanics which treats of the equilibrium of forces and the motion of bodies under the action of forces. It is accordingly subdivided into two parts, kinetics and statics. Kinetics treats of the motion of bodies as related to the forces producing these motions and the masses moved. Statics treats of the equilibrium of forces or of the forces acting upon bodies at rest. Kinematics may be used in the solution of all problems relating to movements of teeth without reference to the forces involved; while the actual motion of the teeth is of great concern to us, our most vital interest lies in the application of forces which stimulate cell activity and thus indirectly cause tooth movement. Dynamics, therefore, must be used in analyzing appliances because tooth movement is a response to the new equilibrium which results when the residual vital forces are supplemented by applied artificial forces. From a viewpoint of engineering, an orthodontic appliance is so nearly stationary that it may be analyzed as a static structure. A static structure is one which is in equilibrium. The forces acting upon the static structure are all in balance. The simple laws of statics provide the means for analyzing the reactions between an appliance and the teeth to which it is attached.

Analysis of appliances used by orthodontists shows them to be composed of the following very simple machines, namely, the lever and the screw. A machine is a contrivance for making a force applied to a body at a given point and in a given direction, available at some other point and in some other direction. In solution of problems involving these simple machines, no special formulas need be deduced or required. They can be solved by the application of the principles of statics.

A force can conveniently be represented by a straight line; one end of the line will represent the point of application of the force; the direction of the line gives the direction of the line of action of the force; the number of units of length in the line represents the number of units of force; while the arrow-head shows the "sense" of the force, that is, whether push or pull.

It can be easily demonstrated from Fig. 1 that if OA and OB represent two forces acting upon a particle O , the diagonal OC of the parallelogram constructed upon OA and OB represents in direction and magnitude the resultant of the forces OA and OB , or a single force OC may replace the forces OA and OB without affecting the state of the particle O . Similarly, a single force OC may be replaced by two components OA and OB or two other forces parallel to any chosen axis as OA' and OB' .

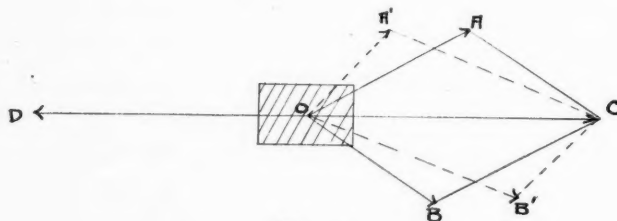


Fig. 1.

Newton's third law of physics states that for every action there is an equal and opposite reaction when equilibrium is considered. Therefore, looking at Fig. 1, OD must be the resultant of the forces acting on O equal and opposite to OC . Thus, when an appliance exerts a force upon a tooth, the tooth sets up a resultant reactive force against the appliance equal and opposite to the resultant of the forces exerted by the appliance. This reaction between the appliance and the tooth is the resultant force which when physiologic is utilized in satisfying the biologic requirements for bone resorption and bone growth.

Experiments by Oppenheim clearly demonstrate how the biologic factor must be considered. By employing spring arches and wire ligatures to the teeth of monkeys (Fig. 2) he proved that positive changes do take place in the bony tissue incident to tooth movement, and that these changes occur in a definite and characteristic manner. His results have influenced our present-day conception of treating cases, and are: First, in regard to movement of teeth: "It shows thereby that in exerting gentle pressure at a point on the crown so as to move the tooth in one direction there is no retrograde movement created in the root region contrary to its occurrence in purely physical

manifestations. The tooth moves in the same direction from the crown to the apex, and furthermore, the movement is more intense near the application of the force and decreases in intensity as the root end is approached." Second, in regard to forces used on vital tissues: "under physical conditions alone excessive forces would produce extensive tooth movement, but upon vital tissues excessive forces react in a reverse manner. By the application of a gentle force, bony changes could be induced which were favorable to tooth movement, but by the application of intense pressure the blood vessels are mechanically compressed, the circulation interfered with, resulting in an inten-

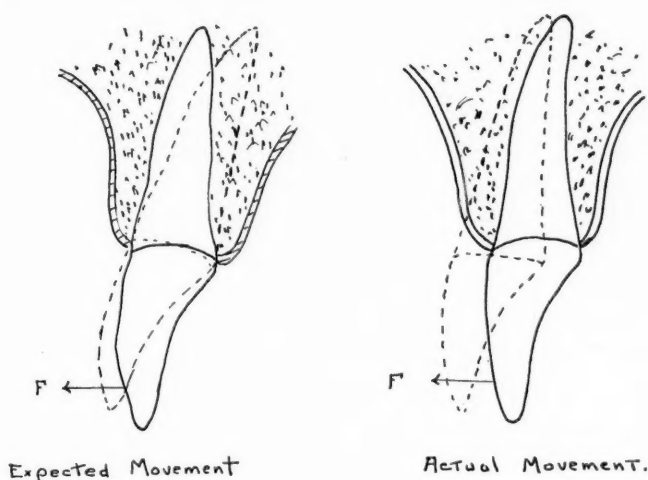


Fig. 2.

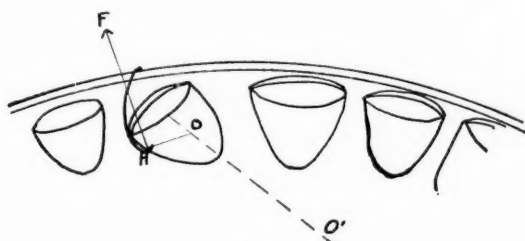


Fig. 3.

sification of the ossific process, no modification in the arrangements of the bony spicules and no reaction in the form of movement of the teeth at all!"

Thus it is evident that several forces acting at a point can be replaced by a single force called the resultant, and that in order to have equilibrium there must be a resultant force of the same magnitude acting along the same line of action, but in the opposite direction. This may be called the first necessary condition for equilibrium.

The second condition for equilibrium is that the algebraic sums of the "moments" must balance each other. Now let us see what is meant by "moment." In Fig. 3 a force F acting at A will indirectly cause a rotation

of the tooth about its axis O . The effect of this force is to produce rotation about axis O which depends upon the magnitude of the force F , and also the distance of the line of action of force F from O . This distance, which is always the perpendicular distance from the axis or point about which the particle rotates to the point of application of the force, is called the arm of the force. It may then be stated as a definition that the "moment" of a force with reference to a point is the product of the force and its arm. If this force should pass through the center O , the arm becomes zero, which eliminates all rotation.

Having now developed the "moment" as force \times the arm, if we should have a pair of forces equal in magnitude, parallel in direction and opposite in "sense" (see Figs. 4, 5, and 6), and a distance C between them, the resultant is

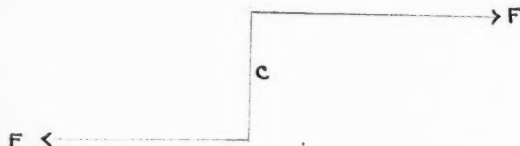


Fig. 4.

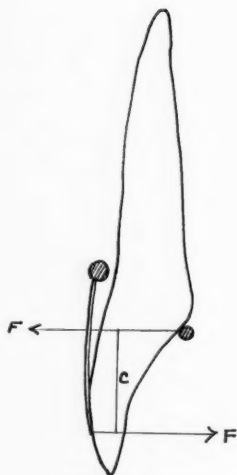


Fig. 5.

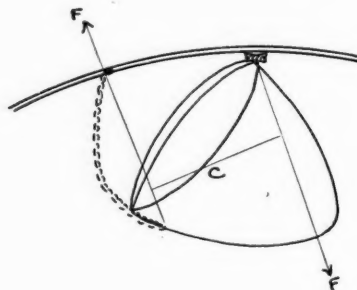


Fig. 6.

known as a "couple." The tendency of a "couple" is purely rotative. It is measured by the product of the force $F \times$ the distance C . This product FC may be termed the "moment" of the "couple." There can be no translative tendency because the two forces exactly balance each other, except in their tendency to rotate the object to which they are applied.

The motion of a rigid body may always be considered as translative or rotative, or a combination of the two motions. Pure translation results in a change in position or bodily movement of the object, without any change in the direction of its axis. We think of this movement when bodily movements of teeth are produced.

Pure rotation is a change of direction or turning of an object about some axis passing through the center of mass without any change in the position

of the body as a whole. Translation is always caused by the application of the resultant of the forces present, and rotation by the resultant of the "couple" acting on a body.

Let us now conceive a body to be in a position of rest, possessing neither translative nor rotative motion. This would imply that the resultant force, the cause of translative motion, is zero and the resultant of the "couple" which causes rotation is zero. Therefore, $F + F = 0$

$$(F \times Arm) + (F_2 \times Arm) = 0$$

This establishes the conditions for equilibrium which states:

(1) The sum of the components of all the forces in any direction equals zero.

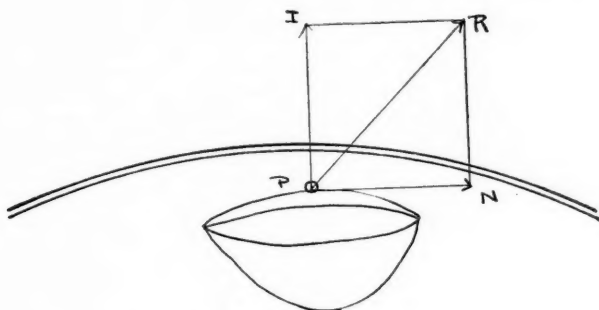


Fig. 7.

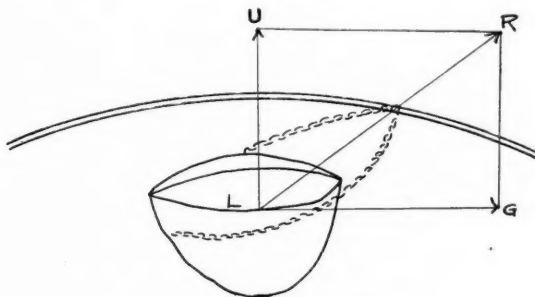


Fig. 8.

(2) The sum of the components of all the forces in a direction perpendicular to the first direction equals zero.

(3) The sum of the "moments" of all the forces about any point equals zero.

Analysis of forces by which we can determine whether the resultant force will be good orthodontic mechanics or faulty orthodontic mechanics is facilitated by the processes of resolution and composition. The purpose of resolving a single force into a number of component parts is to replace the force by some system of forces which may be more conveniently studied than the single force. In the pin and tube appliance we predetermine our components, as having the pin a definite distance mesially or distally from the tube. (Fig. 7.) When the pin is inserted into the tube two forces PI and PN are active,

which are resolved into a resultant force *PR*. The composition of forces is the inverse of this process. A lug on a labial wire ligated to a tooth gives the resultant force *LR* (Fig. 8). By analysis this force can be resolved into its components *LU* and *LG*.

The principles of statics which have been stated are the working tools of the orthodontist as concerns apparatus construction and application. It is only by an intimate knowledge of them that he will be able to apply the desired force in the proper position and correct direction. It is a fallacy to consider that one has to delve into higher mathematics and machine construction for this work. The principles of statics will now be applied to the simple machines used in the mouth during orthodontic treatment.

The lever is a rod or bar either straight or curved supported at one point. The pivot about which the "moment" takes place is called the "fulcrum." The two forces acting on a lever are usually referred to as the "power" and

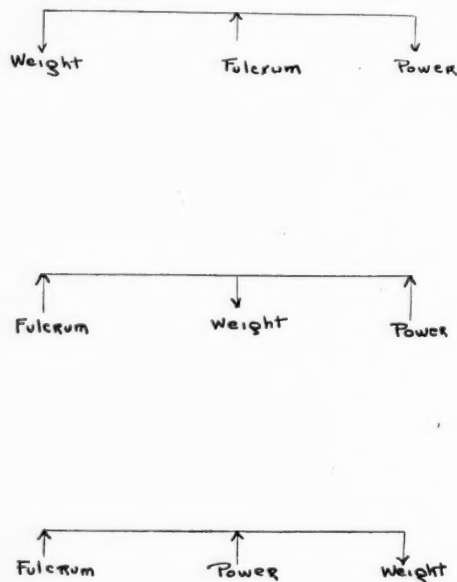


Fig. 9.

the "weight," the latter being the resistance to be overcome whether an actual weight or not. Levers are divided into three different classes according to the relative position of the "power," "weight" and "fulcrum." (Fig. 9.) Levers of the first class have the "fulcrum" in the intermediate position between the "power" and the "weight." Levers of the second class are characterized by having the "weight" between the "power" and the "fulcrum." Levers of the third class are characterized by having the "power" between the "weight" and the "fulcrum." In the first two classes we have a mechanical advantage, that is, the "power" times the arm is always greater than the "weight" times the distance it moves through. $P \times Arm = W \times Arm$. The "power" arm is always greater than the "weight" arm which causes *P* to be less than *W*. In levers of the third class we get a mechanical disadvantage, but a gain in speed.

The screw is a machine which has for its advantage the movement of a large weight through a small distance by a small force acting through a large lever. (See Fig. 12.)

$$P \times A = W \times D \text{ or } P:W = D:A$$

Its slow movement together with its slow delivery of force and positive action constitutes it an available form of machine for use in the mouth.

The force of elasticity as exhibited in springs, stretching of wires and other materials must also be considered when dealing with external forces.

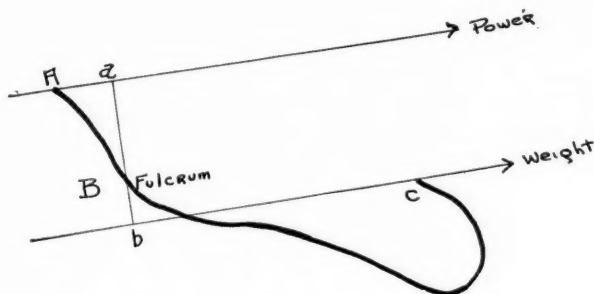


Fig. 10.

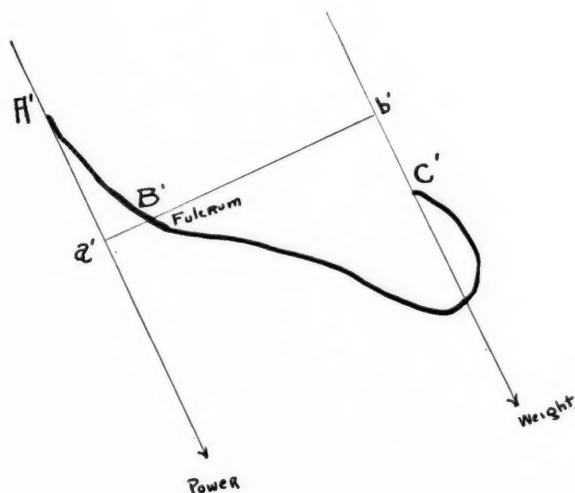


Fig. 11.

A spring is a piece of material in such relative proportion as to length and diameter that, when deformed, tends to return to its original shape. It has the great advantage of exerting a gentle continuous force. Two types of spring force are effective in orthodontia; the elasticity of flexion and the elasticity of torsion. The former is produced by the tendency of a spring wire to return to its original position after bending, as the use of a small spring rotating a tooth, or the use of a lingual wire in general development. The elasticity of torsion is produced by the tendency to untwist after torsion as used in the twisting of a section of wire containing a pin which in the new

position is inserted into the tube or in twisting a section of ribbon arch and inserting the twisted portion into the brackets.

By a study of mechanics the trained mind will plan a perfect and scientifically correct combination of appliances. The orthodontist must understand the relation that exists between pure mechanics and biomechanics, that is, the effect of external forces on living cells. An illustration of this is in the treatment of an impacted canine. It would be impossible to move that tooth by the slight force employed, but cellular activity due to stimulation makes

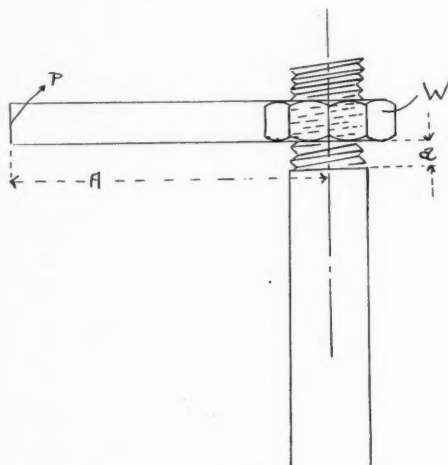


Fig. 12.

this movement possible. In other words, the external forces derived from mechanical appliances are not an end in themselves, but only a means to an end, and are determined, guided and directed by that end. The orthodontist must always keep in mind that appliances are mechanical devices for applying mechanical stimuli to the cells of the tissue resulting in a new balance and tooth position. It is by bone resorption and bone growth that the teeth should be moved. The millions of modified connective tissue cells in adjacent tissues to the teeth which are denominated osteoclasts and osteoblasts are doing the work under the direction of the orthodontist in reply to mechanical stimuli.

THE CRISIS IN ORTHODONTIA*

PART I

4. CRITICAL REVIEW OF THE PUBLICATIONS OF J. A. MARSHALL

ALBIN OPPENHEIM, VIENNA, AUSTRIA

(Continued from page 624, July)

There is no doubt that a correct metabolism is of fundamental importance for the well-being and the resistance of every human being, and that a deficient or abnormal metabolism creates a greater general tendency to react unfavorably to otherwise harmless stimuli. The contention, however, that diet might be of paramount importance to the progress and final result of orthodontic therapy is by no means supported by clinical observation. We observe relapses in children who are reared under the best hygienic and dietary conditions just as often as we observe permanent results in children in whom these premises are by no means verified. No orthodontist can make a prognosis that a relapse will occur in a child on a deficient diet. "Raw fruits and vegetables, milk, and wheat bread, tomato and orange juice and cod liver oil" (Ketcham) are certainly valuable, but whether they can in any way contribute to a better prognosis and to absence of root resorption is more than doubtful.

There is no objection to Marshall's general statement:^{9, 10} "However, in spite of the complexity of the etiology, advantage must be taken of any corrective measures, such as altered diet." However, the specific statement:⁷ "... it is apparent that the type of appliance has less to do with the degree of apical absorption than have the diet and the amount of pressure applied to the teeth by orthodontic bands" (p. 547) cannot be accepted. Even with the strongest forces Marshall was unable to produce genuine root resorption; moreover my own clinical statistics on root resorption¹¹ have demonstrated that no root resorption could be found in any one of the average orthodontic cases treated during the war and during the still worse period immediately after the war, in times of malnutrition and actual famine, under the worst imaginable dietary conditions.

Today we are not yet in a position to predict with certainty the permanency of a result, just as we are unable to guarantee the absence of root resorptions under any dietary conditions.

Marshall⁸ states that in certain patients "the hard tissues are hard only in name. The teeth can be moved easily enough, but . . . they drift back. Later they are moved again only to return a second, third, fourth time to the old malpositions. But with the well-nourished patient the chances are favorable for a satisfactory response to orthodontic treatment . . . teeth, when realigned,

*From the Department of Orthodontia of the Dental Institute of the University of Vienna.

will not tend to drift back to the former malposition" (p. 732). These statements are merely theoretical considerations which are not in accordance with clinical experiences. Even in the best nourished children whose hard tissues are actually hard, not in name only, teeth will often drift back; while in children on deficient diets the teeth, when realigned, will often remain in their new position.

I do not believe that Marshall's statement:¹⁰ "At the present time the evidence points to the fact that the greatest amount of apical absorption is found in animals on deficient diets and in which the stresses maintained have been relatively severe" (p. 256) is sufficiently substantiated by his actual experimental findings, since he has not succeeded (with the possible exception of monkey 35) in bringing about root resorptions comparable to those observed by Ketcham, and since furthermore there is no definite evidence that deficient diet and faulty metabolism are etiologic factors.

Before concluding the critical review of Marshall's work, I should like to say a few words about his consideration of literature and his attitude toward the work of others. At the onset of his work he apparently was not at all familiar with the experimental work done in orthodontia up to that time. Neither of his two first reports in the *INTERNATIONAL JOURNAL OF ORTHODONTIA* in 1930 contains, among the 22 items of bibliography cited in them, one single reference to the earlier orthodontic experiments of Sandstedt, Johnson, Appleton and Rittershofer, or myself.

Not until 1933⁶ do we find in Marshall's writings a consideration of any other experiments except his own. In this paper he discusses the work of several other authors. He states, with regard to my experiments: "Oppenheim made the error of working on deciduous teeth. . . . His findings, therefore, are of little value." To this I wish to state again that on all these deciduous teeth we find a nearly perfect cementum covering, all the way up to the apices of the teeth, which could not be found more perfectly on any permanent tooth (for example, see Figs. 1, 2, 3, 12, and 13 in my article in the *INTERNATIONAL JOURNAL OF ORTHODONTIA*, p. 1201, 1933).

Another evidence of Marshall's attitude in dealing with the literature is his statement that in Gottlieb's¹² work on traumatic occlusion "no resorption of cementum was observed." If the reader will merely turn to the illustrations of Gottlieb's work reproduced by Boedecker in this *Journal* (p. 895, 1932), he will find in Figs. 16, 17, 19, 20, 22, 23, and 24 more or less extensive resorptions of cementum and dentin produced by experimental trauma. In all of the material of Gottlieb and Orban, comprising 33 dogs and 5 monkeys, there was not a single tooth which, after the sixth day of increased occlusal force, did not show at least some resorption of the root surface in the areas of pressure. But these resorptions, like those produced by analogous forces by Marshall, are confined to the sides of the root; their characteristic is that they are promptly repaired as soon as the force subsides, whereas a genuine apical root resorption may go on regardless of any outside force until the entire root is destroyed.

Still another proof of Marshall's lack of familiarity with literature is his statement (Marshall,⁶ p. 17): "*Guessing at the pressure produced upon the*

root is unscientific. Means must be adopted for gauging and controlling this mechanical aspect of orthodontic practice." Early in 1931 there appeared in *Fortschritte der Orthodontik* a detailed study by Nowack¹³ of the forces of spring wires; methods were described for accurately testing the forces exerted by all types of spring wires, including wire loops similar to those used by Marshall. In the same journal was published in January, 1932, the report of Schwarz¹⁴ on histologic findings in dogs resulting from the application of known orthodontic forces; this same study also appeared in the *INTERNATIONAL JOURNAL OF ORTHODONTIA* in 1932.¹⁵ These are only a few of the reports dealing with the measurement of orthodontic forces. Marshall's statement, therefore, seems to be somewhat of an anachronism.

From the remarks in the discussion of Marshall's recent report⁸ (p. 749) I see that the experimental work is over. I am sorry to learn this, because I can find very little in Marshall's experiments up to this time that can contribute to our knowledge of the etiology, diagnosis, prognosis, and treatment of the condition which he set out to investigate, namely, that of genuine apical resorption occurring with or without orthodontic treatment.

The problem of the etiology of this condition is just as obscure today as it was at the time when it was first reported by Schwartzkopff¹⁶ (1887) and Ottolengui¹⁷ (1914).

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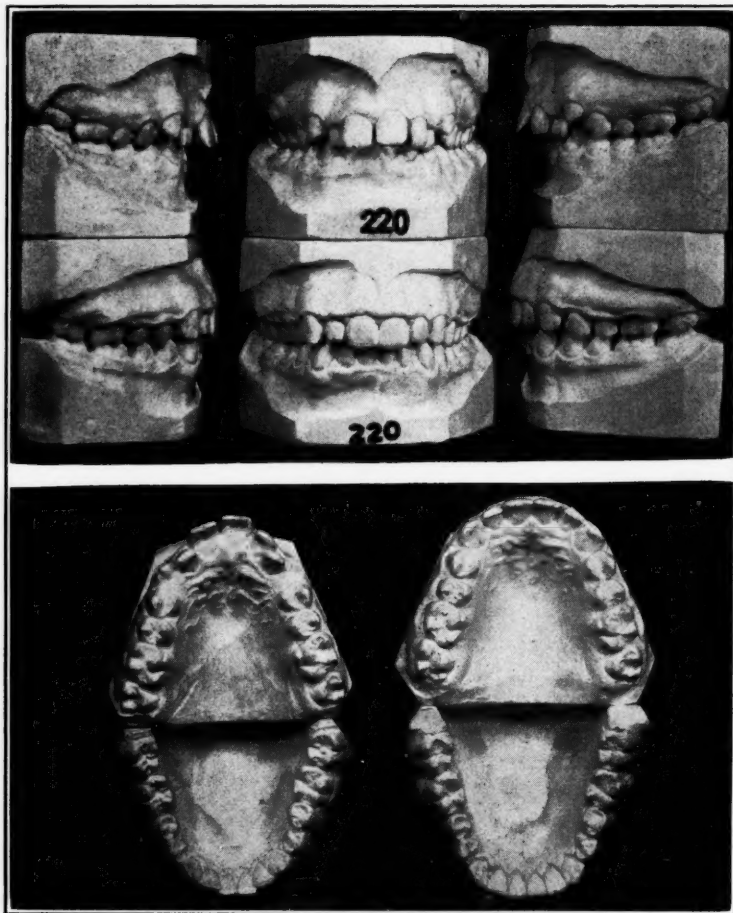
Note.—Part II of "The Crisis in Orthodontia" will be continued in a few months.

CLASS I MALOCCLUSION COMPLICATED BY SUPERNUMERARY INCISOR*

ASHLEY E. HOWES, D.D.S., NEW ROCHELLE, N. Y.

THIS was a Class I case complicated by the presence of a supernumerary lateral incisor on the maxillary left side; this tooth was probably the principal cause of the disarrangement of the anterior teeth. The patient was a girl, twelve years old, with good physical development. It was difficult to decide

Fig. 1.



Figs. 1 and 2.—Models made in February, 1927, and in March, 1930.

from the appearance of the teeth or from the radiographs which of the two maxillary left lateral incisors was the supernumerary. They both seemed to be normal in color, shape, and root development. Because of this fact it was decided to leave the one which would need the least tooth movement, and so the

*Presented to the American Board of Orthodontia, May, 1932.

more lingual one was removed. I felt that the tooth located more labially could be moved into position by a simple spring, while to correct the position of the other tooth would mean banding and root movement. In treating the case the first maxillary molars and first premolars were banded and a labial arch with vertical pins going into tubes on these bands was placed. The section of the arch anterior to the first premolars ran high up like a high labial arch, and light extensions (0.022 gauge) came down from this arch to touch the right central, the left central and the left lateral incisors. A removable mandibular lingual arch containing a Stanton sliding device was placed because both arches needed some expansion. At the end of nine months these appliances were changed. The maxillary anterior teeth were in such a relation that a plain buccal arch going into horizontal tubes on the molars was placed. The mandibular arch was changed to a plain removable lingual arch with clips going over the incisal edges of the anterior teeth. Intermaxillary elastics were then applied, more with the idea of correcting the deep overbite than of making a definite shift in mesio-distal relations. This did not seem to be particularly successful, so a maxillary vulcanite plate high in the front to engage the mandibular anterior teeth and hold the posterior teeth apart was placed.

When the appliances had been worn for about three years, during the last two of which the elastics were worn intermittently, they were removed and Hawley retainers placed. The second set of models was made when the retainers were placed (Figs. 1 and 2). At the patient's last visit to the office she was instructed to leave the plates out entirely and to return in three months. As she has never returned, I cannot give any definite information as to the final result. I hope and believe that it has remained as shown by the last models.

SIMPLIFIED FORM OF APPLIANCE FOR A CLEFT PALATE

J. G. BRITTAIN, D.D.S., HARLINGEN, TEXAS

THE patient was a young woman, twenty-two years old, who had had a cleft palate since birth. She had difficulty in speaking, as a result of the cleft. The cleft extended in the soft tissue area, and there was a small cleft at the border of the hard palate. In such a case as this the velum should rarely extend into that portion of the cleft extending through the alveolar process, which may better be filled with the hard vulcanite.

There are two types of apparatus for restoring the defects of the roof of the mouth, known as obturator and velum. A velum type was made for this patient because this appliance is not a temporary stopper but an elastic movable valve under the control of the surrounding adjacent muscles. It can close or open the passage as the patient wishes; it is applicable to congenital fissures. Occasionally it may be used if the soft palate has been destroyed, but it never should be used for perforations on either hard or soft palate. It more nearly resembles the action of the normal palate and will more readily fulfil its functions. Distinct articulation is more difficult with the obturator.

An ordinary impression tray will not be sufficient for taking an impression of the congenital cleft palate. A paper spoon should be used. By applying soft impression compound to your index finger you can take the impression of the cleft in the hard palate. After applying the impression compound to the cleft and loosening the impression a little, make a soft mixture of solvite, apply it and take an impression of the hard palate cleft again, adjust it carefully, and hold it until set. Then remove by forcing it backward until the impression is loosened from the anterior margin of the cleft. Then take a full upper impression of the maxillary arch in solvite; remove and with an indelible pencil trace the cleft of the hard palate on the tissue; replace the maxillary impression in the mouth to transfer the marking to the impression. After pouring the finger impression and the full maxillary impression cut the full maxillary impression at the marking, and trim the finger impression so that the two impressions will coincide with each other, making the complete cleft model as it appears in the mouth. Then pour up the model, and after separating it you will have the complete impression of the maxilla and of the cleft at the posterior end of the hard palate.

The clasps and bar should be made for the body of the appliance before waxing to make the maxillary rubber plate to hold the velum in place.

The velum model is the next step for consideration. Softened impression compound is shaped between the fingers and thumb. The anterior or body portion of the velum is left thick for a body, while the posterior curtain portion and the flanges are made very thin with attenuated edges. This is accomplished, so far as possible, by molding the softened material with the fingers, after which it is further reduced with a vulcanite scraper and a pocketknife.

After the hard palate is vulcanized and a pin made of 0.040 wire with a button on the end for holding the velum rubber, the plate is adjusted in mouth and the velum curtain is then started. A hole is made through the impression compound model from the oral to the nasal side. A wire of 0.038 is inserted and bent at right angles and waxed to hold the model; the other end is bent to form a handle so as to hold it to adjust it to the cleft. The body must be kept hard, but the curtain and flanges may be softened as required so the appliance can be adjusted to the patient's swallowing, and all excess is trimmed away. Additions may be added by using an impression stick. The velum model must be so adjusted that in the act of swallowing it will entirely close the opening between the oral and the nasal cavities. After the desired adaptation is obtained, chill and make smooth; it is then ready to attach to the hook. Bend a paper clip at right angles to the plate and velum model, attach it to the plate and the velum with sticky wax. This will hold the velum model to the hard plate so that they can be removed at the same time, and it will maintain the correct contour of the velum model to the plate in the mouth. After removing, wax the velum model so that it will cover the hook on the plate put there to hold the velum after the plate and velum have been finished.

After being very careful to remove the impression compound velum from the hook, you are now ready to make a master model. This is done by making a die and counterdie. After die and counterdie are well dried, cut an opening for pouring metal model on the lower border of the velum model in die and also cut an opening to allow air to escape to prevent an air pocket when pouring the metal. After obtaining the metal die you are now ready to make a model for flasking. At this stage you will find the metal die too thick because the impression compound velum was thick at the body in order to handle well in the mouth.

With a vulcanite bur, trim the body to 1.5 mm. in thickness. After trimming, smooth the metal model on both sides. Then take a small gauge lead sheeting (the thickness of a lead covering for x-ray film) and burnish it to the model and allow the edges to bend over the metal model 2 mm. all around the model. Then invest in stone, and allow it to come only to the edges of the metal model.

After the model has hardened, carefully trim to the edges. Bend the lead flaps over the stone model and burnish them to the model. Another piece of lead sheeting the same thickness as the first is burnished to the top side of the lead model; allow a small bit of the edges to overlap and burnish well to the first model and trim the model.

Varnish or soap this half before pouring the second half of the stone model. After separating be very careful not to distort the lower lead lining; if this happens, be careful to replace it. Take a piece of 0.030 wire about one-half inch long; on one end solder a lump of solder or knob; then with a small drill make a hole in the lower model about the same place the pin would be on the vulcanite model; insert the pin to the same depth so that the pin will extend outward about the height of the pin on the vulcanite model and then cement it in place. You are now ready to use the velum rubber in vulcanizing. The lead covering is used to make the velum smooth on both sides; smooth surfaces will not irritate the tissue.

THE TECHNIC OF HANDLING CHROME ALLOY MATERIALS*

BROOKS BELL, D.D.S., DALLAS, TEXAS

I HAVE been attempting to use chrome alloy materials in some form since November, 1932, and in developing the technic described here, I have tried eleven different fluxes, six different solders, and every type of flame imaginable. This technic has been developed through trial and error, and I believe it practically perfect for the materials, solders, and fluxes now obtainable. This technic has been proved by the wearing qualities of the appliances.

Some discoloration takes place at the soldered joints, but the active galvanic action that occurred with the first solders and fluxes causing a black disintegration of the solder does not occur when Rocky Mountain flux and Jelenko low fusing Orthoflex wire form solder are used.

Since overheating destroys the temper of these materials, care must be exercised to avoid a too high heat. They must be kept well away from the blue point of the flame in soldering, that is, about one-fourth inch above it; the flame must be kept small, the size of a round toothpick, about one-half inch high, and with the apex as pointed as possible. I use a natural gas and air flame from a Kerr blow pipe with the Rocky Mountain tip. I always pass these materials through the flame to clean off any foreign material.

BAND CONSTRUCTION OF CHROME ALLOY

Construction by Welding.—Welding of bands has replaced soldering of bands in my practice because welding is done more quickly, the band material is not softened so much, and the joint is stronger. I have not had a single band break at the welded joint in the nine months of use. Absolutely no discoloration or disintegration occurs at the welded joint; therefore irritation of the gingival tissue or danger of etching the tooth is avoided. It is also possible to make soldered or welded attachments directly on this welded joint. Either the Goodall spot welder or the Rocky Mountain spot welder may be used.

The band material is cut 1 mm. shorter than the measurement of the greatest circumference of the tooth. It is then lapped 1 mm., placed on the machine, and a row of spot welds is made along the lapped joint. The band is then ready for stretching, contouring and festooning.

Construction by Soldering.—I do not recommend soldering bands, as a black disintegration occurs at the soldered joint which seems to irritate the gingival tissue at this point; a black gelatinous plaque is also found on the tooth itself at the soldered joint which might cause etching of the enamel.

Draw the band material through curved beak pliers to contour. Cut the material 1 mm. shorter than the measurement of the greatest circumference of the tooth. Perforate near each end once or twice, using jeweler's mainspring

*Demonstrated before the Asociacion Mexicana de Ortodoncia, Mexico City, Dec. 20-22, 1934.

punch which has been machined smaller; this perforation is approximately 0.025 mm. Lap the material 1 mm., thus making the completed band 2 mm. smaller than the tooth to be banded.

Pass through flame to remove the grease, and flux the inner and outer surfaces at the lap, being sure that the flux enters the perforations. Hold in the flame to form flux into a white crust, using a blunt flame; with the band held about one-fourth inch above the point of flame, flow on Orthoflex wire form solder—a gold brad thus being formed. If a black spot is present and solder has not flowed, grind off, reflux, and add more solder. Care must be taken not to overheat, that is, to bright red color, as softening will occur.

Allow to cool slowly; then, using band stretchers, begin to enlarge the band; this manipulation will restore any temper that may have been lost.

SEAMLESS BANDS

These may be obtained from the Rocky Mountain Metal Co., and are called Tru-form bands; they come in twelve graded sizes for maxillary and mandibular molars.

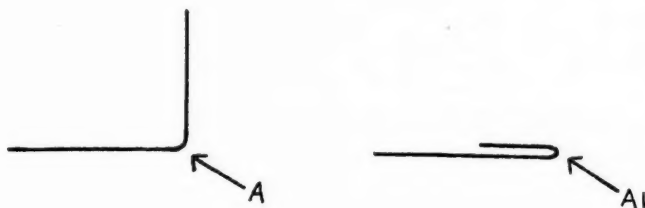


Fig. 1.—Showing point at which wire should be heated slightly, but not to red heat, in making the bend for a recurved spring.

ATTACHMENTS SOLDERED TO BANDS

In soldering round, oval or half round tubes or Ketcham hooks of chrome alloy, scarify the tube and band with a stone, flux the band and the tube, and hold in flame to form a white crust, being careful to avoid blackening. Flow solder on each and then unite.

ATTACHMENTS WELDED TO BANDS

Oval, round, or half round tubes, and Ketcham hooks may be attached to the bands by welding. I have experienced some difficulty, however, in obtaining the proper inclination over the gingival tissue of the oval tubes and correct alignment of the other tubes; therefore I prefer to solder the attachments.

SOLDERING OF WIRES

Pass the wires through the flame to remove foreign matter; flux each, with flux extending about one-quarter inch from point at which solder is to be added and completely encircling the wire; then holding approximately one-fourth inch above the blue point of the flame form a white protective crust. This crust will prevent blackening (oxidation) of the wire at the point at which the solder is to be added and also on either side of this area. Flow solder on each wire, and holding about one-fourth inch above blue flame unite. Care must be exercised

to prevent the wires from becoming heated above a dark cherry red, because the temper will be removed at high heat. Do not dip in water to cool but allow to cool slowly. Any lost temper may be restored by grasping the wire in a pair of heavy pliers and giving it a half turn along its long axis.

In making the bend for a recurved spring it is well to heat the wire slightly, but not to red heat, when the bend is about half made (see A in Fig. 1); when the bend A1 is completed, it regains its temper, preventing crystallization and subsequent breakage.

WELDING WIRES

I see no reason to weld springs as long as soldering is satisfactory. It has been my experience that I can control the heat from the gas and air flame more easily than the heat of the spot weld.

CONSTRUCTION OF LINGUAL ARCHES WITHOUT USING SOLDERED HALF ROUND POSTS

Renfert's band material and 0.036 wire and Hutton's chrome oval tubes are used.

Grasp the 0.036 wire in Aderer's No. 77 (3.32 inch beak) wire bending plier and make a right angle bend (see A in Fig. 2). Placing the beaks along this bend, carry the wire back parallel to the first bend to form a U. Then place

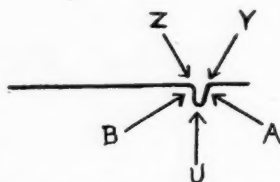


Fig. 2.—Illustrating Ellis technic for forming post to fit into oval tube.

pliers on side B and begin the bend with the long length to form a winged U; when this bend is half completed, heat the wire slightly at point B and allow to cool slowly—this is done to avoid brittleness and subsequent breakage. Then complete the bend to form the winged U. Heat wire to cherry red at U, and allow to cool slowly; then compress this U together with a pair of heavy flat-nosed pliers until the space between the parallel wires is completely closed. (The foregoing technic was conceived by Walter H. Ellis.)

Care must be taken that these parallel wires are not squeezed past each other, thus weakening the post at U; this may be avoided by holding the wire at points Y and Z in a pair of heavy pliers while squeezing at U, or cutting grooves in the heavy plier into which the wings Y and Z may fit.

The post thus formed is then inserted in the oval tube previously grooved on the occlusal with a carborundum disc to allow the wire to fit better, and the usual procedure of adapting the wire to the lingual surface of the teeth is followed until the position at which the post on the opposite side is to be bent is located and marked with a wax pencil; this post is then formed in the same manner as the first.

A great deal of torque which must be removed still remains in the lingual arch. Since direct heat from an open flame is almost uncontrollable, I use an

electric annealer; the positive pole is placed on one side of the arch, the negative on the other; and the current is allowed to flow through the wire. Care must be exercised that too high heat is not permitted, that is, above dark cherry red; absolute passiveness may be obtained in this manner, and the heat is always completely under control.

An annealer comes attached to the Goodall welding machine or may be purchased separately from the Rocky Mountain Metal Co. I made mine out of a transformer used for a toy train and two brass rods which act as the positive and negative poles when the wires carrying the current are attached. By stepping the rheostat up or down, any size wire may be used—the steps run 2.25 volts, 2.4 volts, 3.1 volts, 4.5 volts, 6 volts.

The oval tubes are placed near the mesiolingual angle of the band so that the lock spring will not protrude too far distally. In attaching this lock spring I make a lapped joint to insure greater strength. Flux and flow solder on each wire and unite. After the lapped joint is soldered, grip the 0.024 wire in a pair of heavy pliers and give it a half turn along its long axis—and lost temper will be restored.

If a lock spring is not desired, flow a small ball of solder on the band about the middle third of the distolingual angle; then bend the posterior end of the winged U so that it must spring over this projection when the appliance is properly seated. This lock will withstand the usual forces of mastication; for the post itself, because of its tight fit in the oval tube, also helps retain the appliance; this tight fit may be restored by opening the U slightly from time to time.

BITE PLANE CONSTRUCTION

The usual type of plane with wire lacings may be used. Dr. W. B. Stevenson, of Amarillo, has worked out the following technic, which is much more easily followed:

Take a piece of half round or oval 6, 8, or 14 gauge platinoid wire (according to width desired), and roll it through a gold roller to get the desired flatness, about 0.5 mm. During this process of rolling, carry the end of the wire from side to side so that gentle curves are made. This flattened, curved strip can then be cut to any desired length to fit the anterior part of the maxillary lingual arch wire and form the bite plane. It is attached to the arch wire by soldering in the usual manner, using plenty of flux and a larger semibrush flame.

SOLDERED LINGUAL ARCHES OF CHROME

The usual procedure of conforming the wire to the lingual surface of the teeth is followed. When adaptation has been attained, the arch wire may be held in place while soldering by placing a small piece of moldine on the teeth and wire in the anterior portion of the arch.

Then place wet asbestos fibers on the arch wire just anterior to the point at which it is to be soldered to the band—thus protecting the wire not to be covered with solder from becoming softened by too high heat.

After the wire and band are fluxed and the white protective crust is formed with the flame, wire solder is applied, placing it first to the gingival surface so that it will be drawn up around the wire by the flame. Care must be exercised to avoid blackening, as the solder will not flow on carbonized areas; if they occur, grind off, reflux, and complete the soldering.

POLISHING

I do not use cleansing or pickling agents, as all those I have tried seem to pit or weaken the soldered joints. Any blackened areas are removed with sandpaper discs followed by Burlew discs; a high polish is then obtained with rouge, and the finishing touches are put on with prepared chalk.

ROENTGEN STUDIES IN CASES OF MALOCCLUSION, FROM THE
ARTICLES OF E. BUSTIN AND M. LEIST*

MRS. L. LINDSAY, L.D.S., LONDON, ENGLAND

MRS. LINDSAY said that Dr. Leist asserted that every extraction of a deciduous tooth led to an anomaly in the permanent dentition. He based this assertion on the x-ray pictures which he had been fortunate enough to observe in great numbers. He went further, and said that a normal x-ray picture of a deciduous dentition was a rarity in hospital practice. Caries also had the same effect as extraction, in that by destruction of the crowns of the deciduous teeth, loss of space, needed for the succeeding teeth, resulted. Extraction of the deciduous molars was to be deprecated, especially in the third and fourth years; the germs of the premolars were likely to be extracted with the deciduous molars because there was a connective tissue bond between them, the germs being clasped tightly by the molar roots. This could be seen in the x-ray illustrations. It was a moot question whether the reputed frequent absence of the germ of the second premolar was not due to early extraction of the second deciduous molar. After the extraction of the D the displacement distally of the 3 might be observed, often as far as the mental foramen, while the E did not move mesially but always distally, thus leaving the gap in the place of D. After the extraction of E, 6 moved mesially, and the root of D was displaced distally but did not pass beyond the mental foramen, which appeared to set a boundary to the movement of the D.

In these studies of anomalies of position in the deciduous dentition, the fact emerged that what was considered as a true case of Angle Class III, from the clinical point of view, may prove to be what the authors term a "symptomatic" Class III. The cases of symptomatic Class III might be divided into two categories: (1) malocclusion present in the deciduous dentition; or (2) that arising after the eruption of the permanent teeth. If the former, the x-ray picture will show a gap between the E and the unerupted 6. This gap was generally accounted for by some habit on the part of the patient, such as jerking the fingers out of the mouth after having fixed them upon the mandibular incisors. In these cases the maxillary and mandibular sixes had a marked mesioclusion, a secondary condition, since these teeth had originally been in normal relation, but owing to the habit referred to, the mandibular teeth had been brought forcibly into mesioclusion. Should the symptomatic Class III arise after the eruption of the permanent teeth, there would be a gap seen in the x-ray picture between the erupted mandibular six and the germ of the mandibular seven. When the front teeth met in edge-to-edge bite, this was due either to the fact that the first permanent maxillary and mandibular molars occluded in an

*Transactions of British Society for the Study of Orthodontics, 1934.

incorrect position, or that the mandibular central incisors erupted before the sixes. It was to be observed that the mandibular first and second premolars were pushed against the distal roots of the mandibular first and second deciduous molars. Retraction of the mandibular central incisors resulted in the elimination of the space between the mandibular six and seven. It was possible only by means of the x-ray pictures to determine whether the case was a true or a symptomatic Class III; there was no gap in a true Class III. It might be suggested that this gap was physiologic, but the authors asserted that they had never seen it in any case where an adequate reason for its presence could not be given, such as anomalies in position, or as the result of extraction; besides the gap always presented behind the last erupted tooth and the germ behind it enclosed in the jaw. Curiously enough the cases of Class II met with by Drs. Bustin and Leist were fewer than those of Class III. In x-ray pictures of these cases the unerupted premolars were situated more toward the mesial roots of the first and second mandibular deciduous molars than toward the distal roots; this condition was never found in cases of Class III nor in any normal cases. It arose, therefore, from this research work that the x-ray pictures were not only useful but indispensable in diagnosis and also in prognosis, for it was obvious that in cases of symptomatic Class III, where a gap existed, the result of retraction was bound to succeed, but that where no gap existed, as in true Class III, the anomaly was due to growth of the jawbone, and the hope of success as a result of simple treatment was remote.

DISCUSSION

Mr. G. Northcroft took it that Mrs. Lindsay was speaking for the authors and not for herself when she said that because of the early extraction of the deciduous teeth the roots of 4 and 5 in the last case would not go on growing. He had never heard of such a theory before, and, frankly, he did not believe it. He was sure that the apices of these premolars would go on growing and the foramen close up. He did not see that there was any reason for supposing that because the deciduous teeth were lost prematurely the growth of the roots of the permanent teeth would be affected. Their position might be altered, but not the growth of the teeth themselves. He had been interested in the series of extraoral films, because they were similar to those which he had studied for the purposes of the investigation on the "Princes in the Tower." When studying a number of x-ray pictures in connection with the eruption of teeth, he was particularly struck by the tremendous difference there was, both in the position of the forming crowns in their crypts and in the ages at which the teeth erupted and the different ages at which the roots of the deciduous teeth were absorbed; also in the marked variation that there was in the ages at which the roots of the second molar were developed.

Mr. H. G. Watkin said that he had several cases in which the early loss of the mandibular first molar had been followed by the drifting backward of the mandibular second premolar. He could not account for it, but it was certainly not due to occlusion. There was one other important point. Mrs. Lindsay laid stress on the necessity for preserving the deciduous molars. In Liverpool recently they had had one investigator who had been taking particular notice of what happened when the deciduous molars were extracted round about the age of four or five years, and it was found that in some cases the tooth germ of the succeeding tooth had come away between the roots of the carious deciduous molar. It appeared to him very likely that when, later, the tooth was said to be absent, the fact was that the germ had been extracted with the deciduous tooth.

Miss K. Corisande Smyth mentioned two cases which she had lately seen that had been brought to mind by what Mrs. Lindsay had said. First of all, in connection with the two groups of Class III, the symptomatic and the true, as far as she could remember Mrs. Lindsay's statements, the symptomatic ones were characterized by the spacing of the teeth and the true ones by contact of the teeth. She wished to ask in which category one could place those cases that were obviously too long in the mandible. Those were associated with actual spaces between the premolars and the canines and the molars. There seemed to be too much length of bone together. She had always thought that these were examples of true mandibular protrusion cases, but that did not seem to fit in. In one private case, a boy of ten, the patient had already had the four first premolars extracted, and there was a tendency to an extra length of mandible even at that time. With regard to the extraction of the teeth, that was out of her hands, the extractions were done, the spaces were there, and she did nothing to the mandible, but a great deal of expansion to the maxilla. There was a quite reasonable overlap of 1 or 1.5 mm. of the maxillary incisors, but during the two and a half years she had been treating the case, the mandibular arch had come forward at a tremendous rate, and not only had the spaces completely closed in the mandibular arch, but the second premolars were now obviously pushing the canines over the lateral incisors, and the whole arch was shifting right forward. In desperation that very day she had put a little splint on the maxillary canine which engaged in the space between the mandibular canine and premolar. But all the back teeth were in contact, and there seemed to be a crowding of all the teeth in the mandible, and this protrusion was increasing in spite of the loss of teeth. In connection with the loss of deciduous teeth, she had always been taught that it was very important to retain them for the purpose of keeping spaces for the permanent teeth, and if they had to be lost it was very important to put in some kind of splint to retain the space. While she had been talking about this very thing, a case that she had not seen for three years turned up at the hospital. It was a case in which treatment had been proposed, but owing to financial difficulties the patient had been lost sight of. At the age of eight the boy had lost all his deciduous teeth; he was a distinct Class II case, with a very small mandible and mandibular arch, and she had intended to insert a splint plate in the mandibular arch to retain the spaces. When the boy appeared, after three years with no treatment, models were taken, and it was found that all his mandibular premolars had come into place quite regularly and properly, with no loss of space at all.

Mr. Robert Cutler asked whether the symptomatic cases were characterized by a marked family history.

Mrs. Lindsay.—No, not those, the true ones.

Mr. Cutler said that he thought the work which Mrs. Lindsay had brought forward was of tremendous value to them in deciding as between true Class III cases and symptomatic Class III, which he (Mr. Cutler) called Division 3, Class I. Another important point of differential diagnosis was that the symptomatic Class III cases always looked very much better—either in profile or in the general facial ensemble—than one would suppose from the plaster cast of the models. On the other hand, the Class III did the reverse, looking less serious in the models than in actuality.

Mr. Harold Chapman said that he had been surprised to hear that certain of these cases presented such difficulty in treatment. He was wondering on what lines the treatment was undertaken, whether it was to move the teeth through the bone or to endeavor to move the mandible itself backward, and, with the mandible, the teeth. He did not recall the difficulties in moving the mandible distally, or changing the occlusion that, he concluded, the orthodontists in question had had, provided the age of the patients was suitable. His own endeavor had been to move the whole mandible back rather than the teeth through the jaw. He did not see what the difficulties were unless there were some factors which were not apparent in the x-ray pictures.

The *President* said he understood Mr. Watkin to refer to the necessity of preserving the deciduous dentition even to the point of draining a septic tooth—he felt that he could not quite mean that. As one who was responsible for some 500,000 children in the London area, his own principle was that if a tooth could not be made healthy it should be removed, but there was material in that alone for an evening's discussion.

Mrs. Lindsay, in reply, said that she was afraid she had not made quite clear the difference between the symptomatic case and the true. In the former the gap was always between the last erupted tooth and the tooth lying in the jaw behind it, and the prognosis was always favorable. But where the gap lay in front, as Miss Smyth had mentioned, then that was a true Class III. If there was no gap behind the last erupted tooth, the prognosis was unfavorable, and, in fact, putting appliances on such a case seemed to add to the trouble and to stimulate the growth to more activity. Mr. Northcroft had mentioned the question of the growth of the roots; that, of course, was the author's statement, especially in the third case of extraction, where the \bar{D} was extracted early, and only the crown had erupted. She had once taken out a tooth of that description in an adult and was afraid that she had left the remains of the tooth in the jaw; the root had evidently had some check and was arrested in development. Dr. Friel had shown her a case in which he was afraid that his treatment had caused absorption of the root, but she was not of that opinion, and she thought the case was of a similar nature to the one shown in the x-ray picture. Mr. Watkin had spoken about the retention of the deciduous molars. She had always kept the deciduous molars as long as she could, but, of course, in a clinic one could not see the children often enough to be sure that the roots were drained. In a school clinic she was sure that would not be the right thing. With regard to extracting the germ of the oncoming tooth, she had experienced that misfortune herself. Once she extracted a mandibular \bar{E} and thought it was an abscess at the end of it, but it was the germ which came out with it. That was in a child of four years. She thought she had already answered Miss Smyth's questions about the spaces. She was sorry that she had not made it clear about the symptomatic and the true, because the former was the favorable condition, and it could only be diagnosed by x-ray pictures. It was found when there appeared a space between the last erupted tooth and the tooth in the jaw immediately behind it.

Department of Dentistry for Children

THE VALUE OF EARLY DIAGNOSIS AND TREATMENT OF ULCERATIVE STOMATITIS IN CHILDREN

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IN ORDER that the dental profession may shoulder its responsibilities in the great problem of health, it is necessary to emphasize the importance of oral examination for the child patient. In the past the trend of dental education has been to improve the technic of dental restorations rather than to emphasize preventive measures. To maintain and preserve the general health of the child patient it becomes more and more necessary for dentists to make an early diagnosis of the ulcerative conditions which occur in the oral cavity. Until recent years the examination of the child's mouth consisted only of a casual glance and exploration to determine what teeth could be filled and what teeth should be extracted.

A true diagnosis can be made only by one who has a thorough knowledge of histology, bacteriology, anatomy, and pathology of the tissues involved. There is an intimate association between local diseases of the mouth and general systemic conditions; hence it is imperative that the child should have constant dental care.

The key to success depends upon the possession of an extraordinary degree of sympathy and patience with children. First, the patient's complaint should be considered, and, if instant relief can be instituted, it should receive one's immediate attention. In every instance a full description of the complaint should be obtained from the child or parent and should be included in the history. In addition to this, the history should include the present illness with full details of the symptoms, preceding oral and systemic lesions, habits, etc.

The dentist, having obtained the desired information, should proceed with the examination as follows: (1) Is the pathologic condition of local or general importance? (2) Are there constitutional symptoms which may be associated with the oral lesions? (3) Are the gums and mucous membranes abnormally colored and swollen?

Great care should be taken to notice atrophic or hypertrophic appearance of the gum margins, alterations in the positions of the teeth, flow of the saliva, and the general appearance of the mucous membrane of the cheeks, particularly whether they are well or ill supplied with blood. If a rash is present, its character and distribution should be carefully observed. Any suspicious lesions should be palpated, their outline studied as well as the base, discharge and condition of the adjacent tissues. It may even become necessary to make a histopathologic or blood examination to confirm the diagnosis.

A general examination of the teeth should be made with regard to impactions, supernumerary teeth, occlusion, caries, and restorations. This necessitates a thorough x-ray examination. The oral examination having been made, the general development of the child, his facial expression, attitude, and the color of his skin should be observed. In connection with the head note the shape, size, and condition of the fontanel. The cervical and salivary glands should be examined. An acutely infected gland will feel soft; a chronically infected gland will feel hard; whereas a normal gland will not be felt. In spite of the detailed investigation, this examination can be made in a relatively short time.

Simple stomatitis is an uncomplicated ulceration of the mucous membranes of the oral cavity, which seems to affect poorly nourished children and is often associated with various acute infectious diseases. There is a simple catarrhal inflammation involving the gums, lips, and mucous membrane. The tongue is often swollen and coated with a yellowish color; there is an offensive odor of the breath; and the teeth are sometimes elongated. A smear will reveal an association of streptococci, staphylococci, diplococci, and micrococci. Alimentary elimination and a boric acid mouth wash or a weak solution of potassium sulphate will usually produce a cure.

Traumatic stomatitis is usually caused by biting of the tongue or cheek, abrasions from rough food, or ill-fitting orthodontic appliances. The character of the ulcer depends largely upon the injury; however, as a general rule, it is red, swollen, and painful, and has ragged edges. A traumatic ulcer may sometimes be mistaken for a syphilitic lesion, but, if the history is carefully considered, the correct diagnosis can generally be made without a serologic examination. The source of irritation having been removed, and the ulcer having been painted with tincture of iodine and aconite (3 per cent), healing will take place immediately.

Parasitic stomatitis (thrush) is characterized by the presence of white patches upon the tongue, cheeks, and gums. It is due to a fungoid parasite known as *Saccharomyces albicans*. The predisposing cause is uncleanness, the most frequent source being infected feeding utensils. The treatment consists in removal of the cause, sterilization of the feeding utensils, and a good antiseptic mouth wash.

Herpetic stomatitis is an exceedingly common infection in children, indicative of febrile diseases, such as chronic colds, pneumonia, and meningitis. The sores, which are very painful, vary in size from a pinhead to a dime. The child will have a tendency to pick at the sore, which often may establish a secondary infection. The lesions often appear in clusters and are accompanied by fever. At first the contents of the vesicles are clear and transparent, but later they become of thicker consistency and dry up in a few days, leaving a series of pronounced crusts, which if removed are renewed. A laxative should be given to promote elimination, and frequent applications of spirits of camphor will produce instantaneous cure.

Perlèche is a contagious disease of bacterial origin. It is confined to the corners of the mouth, and is characterized by deep cracks or fissures. The child will have a tendency to lick the inflamed burning corners of the mouth and

fissures. The treatment of perlèche, which may sometimes be mistaken for syphilis, consists in applying 7 per cent tincture of iodine to the infected area.

Apthae are characterized by whitish, sharply contoured ulcers, occurring in the posterior part of the hard palate, and due to abrasion of bottle, nipple, or thumb-sucking. These ulcers very often become enlarged and painful. Removal of the cause and swabbing the ulcerated area with a 2 per cent boric acid solution will promote healing.

Stomatitis Due to Difficult Dentition.—Difficult eruption of the child's teeth from six months until two years of age has caused much discussion. The signs of teething in healthy children are swollen and inflamed gums, localized gingivitis, which causes pain, disturbance of sleep, loss of appetite, increased flow of saliva, and slight temperature. The child will have a tendency to put his finger or some hard article in his mouth and bite on it. Difficult dentition usually occurs more frequently in poorly nourished children.

A partially erupted tooth should be painted with 5 per cent mercurchrome or 3 per cent iodine and aconite. Very seldom does the overlying gum tissue have to be lanced, but when deemed necessary a cross incision is made over the crown of the erupting tooth, and any part of the tissue that would harbor food is excised.

ORAL MANIFESTATIONS OF CONTAGIOUS DISEASES

The early symptoms which should arouse suspicion of commencing communicable disease are disinclination to play or study, unusual "tired feeling," drowsiness, cheeks flushed or pallid, chills, vomiting, coughing, sweating, discharge from the nose, throat, or ears, swellings in the neck, red eyes, sore throat, and fever. As a general rule, ulcerations in the oral cavity precede most of these manifestations, especially in cases of Vincent's infection, measles, scarlet fever, and often syphilis. For his own protection as well as the child's the dentist should be able to diagnose these conditions.

Vincent's Stomatitis.—Daily in the Forsyth Dental Infirmary in Boston cases of chronic or acute Vincent's infection are observed. Most frequently the affected child is undernourished, with an ill-kept mouth.

In chronic cases of Vincent's infection pain is infrequent, the infection usually being localized to a certain area of the mouth. A mild inflammation of the gingival crest with a tendency to hemorrhage is the outstanding symptom.

In acute cases the gums are swollen and spongy with the formation of a white pseudomembrane which can be easily wiped off, thereby producing hemorrhage. The flow of saliva is abundant; the odor of the breath is offensive. Large and painful ulcers covered by a whitish gray membrane occur in the folds of the cheek. As a result of these conditions there may be a rise in temperature, mental depression, loss of appetite, and the glands of the neck may become swollen. A microscopic study of a smear from the lesions will show the fusiform bacilli and Vincent's spirochete, together with various other types of bacteria, confirming the diagnosis.

Innumerable drugs have been used in the treatment of this disease. Since the organisms causing Vincent's infection are anaerobic, the use of a drug which

will liberate oxygen freely should be used. In the past- sodium perborate, hydrogen peroxide, chromic acid, and others have been used. The alternate use of copper sulphate and neoarsphenamine, locally applied, has been recommended by some authorities. At regular intervals during the day the mouth should be rinsed out with sodium perborate, one teaspoonful to a glass of warm water. The dishes and linen which the patient uses should be thoroughly boiled, and the treatment continued until the symptoms have disappeared. The child, placed on an alkaline diet, should be given fruit juices in large amounts, and often cod liver oil, which will aid in building up his resistance.

Syphilis.—The most frequent symptoms of syphilis are fissures, mucous patches, and ulcers. The characteristic crescentic notching of peg-shaped incisors and the so-called mulberry molars are very important signs of congenital syphilis, particularly when these signs are accompanied by lesions of the mucous membrane. Hypoplasia, delayed eruption, anomalies of shape, structure, and number of the teeth are other dental syphilitic stigmas. Syphilis, however, is only one of the causes of these conditions, since they seem to be incurred by functional and nutritional disturbances also.

Fissures, being found most frequently upon the lips, are very contagious, hemorrhaging often, and persisting in spite of treatment.

Mucous patches are groups of papules which develop from the mucocutaneous surfaces, having a whitish color and varying in size. They usually develop in the second stage about three to six weeks after the initial lesion. Although the tongue is the most common location, any part of the mucous membrane may be affected.

The question may arise that the child is less likely to acquire syphilis than an adult, but from Fournier's statistics of 42 cases the age at which the disease was contracted was as follows: 19 acquired it the first year; 10, the second year; 7, the third and fourth years; and 6, from the fifth to the fourteenth year.

Syphilis is described in three clinical stages, namely, primary, secondary, and tertiary. Syphilis characterized by the chancre usually occurring at the point of infection is primary. The chancre appears as a painless, indurated, subcutaneous mass which is infiltrated, feeling like cartilage. In the majority of cases it is about the size of a dime, having a punched-out appearance and covered by a grayish yellow secretion. The nearby lymph nodes of the neck are swollen and painless. A smear from the lesion, using a dark-field microscope, will probably show the *Spirocheta pallida*. The Wassermann reaction will confirm the diagnosis.

The secondary symptoms will follow the primary lesions in approximately six weeks. Mucous patches are the oral manifestations of this stage. In addition to this, the virus is present in the blood and lymph circulation. The patches sometimes break down into an ulcer that is undermined, sharply defined, and covered by a whitish detritus, at which stage it is very contagious.

The characteristic lesion of the tertiary syphilitic stage is the gumma. There may be necrosis, perforations of the palate, and profuse bleeding. By this time

the child's parents are aware of the disease, and the child should be referred to a physician immediately for constitutional treatment. The dentist should prescribe strong antiseptics and insist on proper mouth hygiene.

Scarlet Fever.—Its first symptom is a sore throat, following a very short incubation period. The tongue, raspberry colored, becomes swollen, and minute red points appear upon the hard palate simultaneously with an erythema of the pharynx and tonsils. A body rash is generally preceded by these symptoms. A physician should be consulted for treatment.

Measles.—In the mucous membrane of the mouth there is a decided change before the skin eruptions appear. Numerous small red patches with a white, central spot will appear on the mucous membrane, and the tongue is furrowed, with eruptions on the side. The child will have a headache, and the temperature will begin to rise.

Diphtheria.—Diphtheria lesions begin in the throat with a redness of the forces, thereby causing the child's first complaint—difficulty in swallowing. Upon the tonsils and pharynx there forms a grayish white membrane which will bleed upon the slightest provocation. A smear will reveal the diphtheria bacilli.

When there is any doubt about one's diagnosis of any contagious disease, the child should be referred to a physician. The dentist's part of the treatment consists in prescribing medicinal agents to promote mouth hygiene.

Metallic Poisoning.—Certain forms of stomatitis occurring in the mouths of children are due to metallic poisons, and the dentist should be able to diagnose them as such. The most common of these are mercury, lead, phosphorus, and bismuth.

A gingivitis with a hemorrhagic line around the teeth at the free margins of the gums will be found in mercuric poisoning. The patient has a metallic taste in his mouth, increased flow of saliva, and sometimes loosening of the teeth. To make a diagnosis an accurate history is necessary. The treatment consists in removal of the cause and elimination of the already absorbed mercury by the administration of saline cathartics. Hexylresorcinol may be used as a mouth wash, diluted with equal parts of water.

There is a marked similarity between the symptoms of lead poisoning and those of mercury poisoning. In lead poisoning a bluish black line (Burton's line) is found around the necks of the teeth, accompanied by stomatitis of the gums and pigmentation of the lips. The history will differentiate it from mercuric poisoning. Chlorate of potash (5 gr. to ounce) as a mouth wash and potassium iodide as a tonic are very good treatments. Where there is a marked gingivitis, a piece of gauze should be placed between the cheeks and gums, thus adding to the patient's comfort.

In phosphorus poisoning inflammation begins about carious teeth, food packs and injuries of the mucous membrane. The red and swollen gums bleed very easily. If allowed to continue, abscesses and necrosis may occur. Most often the child will give a history of playing with matches. To promote elimina-

tion a purgative should be given, and to relieve inflammation bland mouth washes should be used.

Copper poisoning causes a characteristic greenish red line around the gingival border, and frequently the skin has a greenish tint with cutaneous eruptions. Allowing children to play with copper articles is generally the etiologic factor. It is treated the same as phosphorus poisoning.

Stomatitis due to bismuth poisoning produces a tenderness of the gums and teeth, ulceration of the gums with the formation of bluish macules the size of a dime under the tongue and in the buccal folds. The free borders of the gingiva become red and swollen, and this gradually spreads toward the base of the gum. A careful history must be taken to avoid confusion of symptoms with those of lead poisoning. The treatment is the same as in other forms of metallic stomatitis.

To prevent serious complications which may follow these symptoms their early recognition is important.

Medicamentous Stomatitis.—Overuse of phenacetin, quinine, calomel, antipyrin, argyrol, and many other drugs may produce ulcerative and pigmentary changes. A correct diagnosis can be made only after a careful history has been taken and studied. The oral symptoms may sometimes vary from congestion of the pharynx, swelling of the tongue, and edema of the lips to vesicular lesions, followed by erosions and deep ulcerations. Drug allergy requires no further treatment than elimination.

Allergic Stomatitis.—Often inflammatory conditions occur in the oral cavities of children which may resemble Vincent's infection but are due to a hypersusceptibility to certain protein foods. The phenomena are not limited to any given class of proteids, but are manifest in case of animal or vegetable proteins. The food causing this condition can sometimes be determined from the history; however a true diagnosis of the cause can be made after the patient has been given the protein to which he or she is susceptible, which is manifested by the inflammatory changes in the mouth. When an inflammatory condition fails to respond to treatment, the dentist may suspect the condition to be due to an anaphylaxis reaction. Allergic oral disturbances may be caused by contact with animal, vegetable, or mineral irritants, such as certain plants, wheat, eggs, milk, tomatoes, cabbage, oranges, and potatoes.

Capillary atony together with extensive hyperemia, which results in maceration of epithelial covering of the papillae and the gingival margin, constitutes the local pathologic disturbance. The treatment consists in elimination of the offending food from the diet and prevention of a secondary infection. A mild warm alkaline mouth wash and a suitable supportive diet are recommendable. Caustics should not be used. Desensitization is complicated because of the difficulty of securing the food proteins in solution for the subcutaneous injection that will be sterile and nonirritating. Sometimes by beginning with small amounts and gradually increasing the quantities, the patients can be desensitized to certain foods.

CONCLUSION

There should be an intimate association between the dentist and the physician, since so many oral lesions are due to systemic disturbances.

By carefully examining the child's mouth, taking an accurate history, making a correct diagnosis, and instituting early treatment, the dentist prevents many serious complications and abnormalities that might follow.

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MALNUTRITION

WHY CHILDREN DO NOT GROW IN WEIGHT AND IN MENTALITY

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I SHALL digress and take into consideration the many prenatal causes of malnutrition, which are important. Some one has truthfully said that "the soul of a child is like plaster of Paris, that can, like dough, be molded into any shape we desire." I am sure that every American woman can do as well as Mary's cat:

Mary had a little cat,
It swallowed a ball of yarn,
And when the little kittens came,
They all had sweaters on.

This means that if the prospective mother will eat the ordinary American diet, like milk, eggs, cereals, bread, meat, fish, green vegetables, fruits in season, especially the citrous variety, and drink a certain amount of water, she will bring into the world a well-developed infant with normal skin, a sufficient pad of fat beneath the skin to stand the new temperature to which the child will be subjected. There will be normal bone and tooth formation and sufficient lecithin for proper nerve development. About the second or third month of pregnancy an extra amount of vitamin D, in the way of cod liver oil or haliver oil and viosterol, should be taken. The pregnant woman should be given graduated ultraviolet rays to increase the hemoglobin and red cells, as well as the calcium in the blood, which is supposed to assist in bone and tooth structure. Since infants are given this treatment early, should they not receive it through the placenta? About the seventh or eighth week of fetal life the deciduous teeth begin to form, or about seven months before the baby is born, and at birth all the deciduous teeth are developed and also the first permanent molars, which are also the first permanent teeth. Therefore, as already stated, it is necessary for the expectant mother to eat and assimilate only such foods as contain all the elements that make up the body's structure. She must have fats, carbohydrates, proteids, iron, and lime salts which make up the child's bony framework and the formation of his teeth, deciduous and permanent. The enamel of the tooth is the hardest of all bony structures. There are foods containing every element of nutrition necessary for the normal growth of the body. The trouble has been that until recently we did not quite understand what foods are necessary for perfect development of both mother and infant. The mother is feeding not only herself, but also the fetus for nine months, and she is then expected to produce good nutritious milk for at least another nine months with supplemental feedings. Mother's milk contains every element of nutrition in

an easily assimilated form; also one of the glandular elements which protects the infant from infection and infectious diseases is secreted in mother's milk. That substance is thyroid, which gives natural iodine. The infant's thyroid is not developed for some years, and for that reason he is more susceptible to infectious diseases and has little power of resistance. If the mother is unable to nurse her infant, the child may be given a wet-nurse. It is well for us to remember the effects of the thyroid upon the body. Children of parents with cachectic diseases, such as chronic tuberculosis, syphilis, alcoholism, and excessive use of tobacco, are often born with a congenital atrophy of the thyroid, thereby stunting their growth. In cretins, degeneration of the thyroid remains, and, as a rule, the children are dwarfs all their lives. By giving thyroid in these cases, wonderful results are obtained. At birth there is no colloid or thyroid, therefore, no iodine. Where the infant must be weaned, some physicians give minute doses of thyroid.

We next turn our attention to the consideration of two "isms" which have spread like wildfire all over this country. I refer to alcoholism and nicotineism. I shall try to explain, as briefly as possible, the deleterious effects on prospective mothers especially. In everyday life we are exposed to worry and disappointments; and as many of us tire easily after work, we frequently feel an inclination to take something to cheer us up and to incite us to further exertions; thus we take stimulants, such as alcohol, tea, coffee, tobacco, etc. We may compare these stimulants to a whip with which we urge on a horse. On the other hand, there are thousands of men and women, girls and boys who are drinking, and drinking to excess, for no other reason than that it has become stylish; to be popular they must do as the rest do or be wallflowers; many never even reach the wall. The alcohol and tobacco habits have spread to such great proportions that it will take the combined effort of army, navy, and air forces and then some to bring about reform.

Alcohol may be taken in moderation or ordered by a reputable physician, but if taken in large quantities it degenerates the heart muscles and also produces the condition known as hardening of the arteries (arteriosclerosis). Its effect on the brain is particularly deleterious; if it is taken habitually, as by chronic alcoholics, these mental changes may develop into a permanent character, and insanity may follow. According to some statistics, 60 per cent of the inmates of lunatic asylums were alcoholics. Out of 579 lunatics of the Provincial Insane Asylum, in Vienna, some years ago, 40 per cent were alcoholics. Insanity and crime are closely related; in fact, crime may be regarded as a nervous disease. We should, therefore, not be surprised to find so many criminals among alcoholics. The frequency of impotency in chronic alcoholism proves how injurious to the sexual glands are large quantities of alcohol. This also applies to the adrenal gland, as shown in the frequency of arteriosclerosis among alcoholics. Dr. Sajous finds that alcohol has a very deleterious effect on the pituitary body. The ill effects of alcohol on the kidneys and the liver are amply demonstrated. A matter of grave importance to us is the degeneration of the thyroid in alcoholics, which lowers the power of resistance to infection or intoxication, in con-

sequence of the lack of these important protective elements which are derived from the ductless glands, a fact which various epidemics amply prove. In Mexico during an epidemic of yellow fever, the alcoholics were the first to contract it. Heredity depends on the condition of the ductless glands of the parents. Nervous diseases such as idiocy, epilepsy, etc., are also of constant occurrence among these. From the foregoing facts it is clear that large quantities of alcohol are most injurious, but there is no scientific evidence to prove, with exactitude, that small doses are harmful. It has been proved in most colleges that the students who were nondrinkers were the best scholars.

TOBACCO

Tobacco is a plant, the leaves of which, when prepared by a special process and smoked in the shape of cigars or in pipes, are able to produce in many people a feeling of exhilaration; and many such smokers are able to do more work, especially brain work, with the aid of a good cigar. Tobacco contains, in addition to noxious salts, a poisonous alkaloid, nicotine, which produces in small amounts in those not accustomed to it, and in all people if in larger quantity, a condition of intoxication. When nicotine is taken for many years, and sometimes even in a shorter time, either by smoking or chewing, very injurious consequences from nicotine poisoning may ensue. According to Konig and other authorities, cigarettes are the most dangerous in this respect. It is a mistake to think that no nicotine is introduced into the system.

Dr. Mulhall, of St. Louis, an inveterate smoker and an authority on the effects of cigarette smoking, says: "Cigarette smokers may be divided into those who inhale the smoke and those who do not. The latter class is a very small one and the pleasure is just the same, in a milder degree, as that of the cigar smoker and pipe smoker, who make a smoke chamber of the mouth. But all real devotees of the cigarette inhale. That is, with a quick inspiratory act, the smoke is drawn through the larynx into the trachea, and, so far as he has been able by different experiments to learn, into the first division of the bronchial tubes. Inhalation explains the pleasure of cigarette smoking. If the cigarette smoker did not feel the smoke in his larynx and windpipe, his pleasure would be gone. Nicotine always produces great harm in youth. Dr. Mulhall says he has never seen a child (meaning one that had not reached puberty) who used tobacco habitually whose health was not impaired." Nicotine may exercise a fatal action on various organs, for instance, on the inner parts of the eye and the optic nerve, and the nervous system; but without doubt its most injurious action is on the heart and the stomach. At first it may cause only an irregular pulse and an occasional feeling of stopping of the heart, but if continued it will assist in the development of hardening of the arteries (arteriosclerosis), which is probably caused by the action of this substance on the adrenal glands. According to Sir Lauder Brunton and others, tobacco raises the blood pressure, sometimes enormously. Brunton says: "I do not know that there is any one thing that causes such a tremendous contraction of the vessels and raises blood pressure to such an enormous extent as does nicotine, except perhaps the extract of suprarenal capsules, which has an action almost identical with nicotine." Nicotine is

one of the most virulent poisons known. One drop in concentrated form is sufficient to kill a dog. Excess enfeebles digestion, produces emaciation and general debility, and lays the foundation for serious nervous disorders. Blindness without apparent reason and color blindness have been produced by it; even insanity has been ascribed to tobacco poisoning. In an article appearing in the *Atlanta Constitution* Sunday, February 17, 1935, entitled "Leading Augusta Citizens Urge Passage of Pending Selective Sterilization Bill," it was stated "that the number of mental defectives in the state is rapidly increasing. Five times as many individuals are entering homes for mental defectives each year as are being registered in universities and colleges of our country. The more than \$50,000 appropriated annually to Georgia's only home for mentally defective children could barely provide for 256 of the 10,000 known feeble-minded individuals in our state. A reputable and conservative Georgia physician has stated that unless our legislatures take this matter seriously within the next one hundred years, there will not be enough normal people to care for the sub-normal." I have given two real causes. Think it over; never take a drug, even a laxative, without consulting your physician. Drugs for the relief of insomnia, headache, toothache, etc., such as amytal, sodium amytal, luminal, and others, not only are harmful but also are habit forming to a great extent. Your physician should direct dosage.

MALNUTRITION

To Professor Wm. R. P. Emerson and his coworkers, who in 1908 established the first nutritional clinic, we owe a great deal; although his name and fame are seldom mentioned, much of what I shall now tell you is due to his untiring work. The care and feeding of infants has become not only a science but an art. Accurate studies have been made in regard to food constitutions, measured feeding, hygiene, and every detail of growth and development. After the age of two years, however, the physical condition of the growing child receives little consideration by either physician or parent, except in actual illness. Although this is a most important time for the child's nutrition and growth, little is done to make sure that he will pass through these years safely and reach maturity physically and mentally sound. Food and health habits are formed during this period, and it may be said with a fair degree of certainty that if good health is established at this time it will continue throughout the years of adult life. At least a third of all children in this country are underweight for their height, undernourished and malnourished. This condition was found alike on the East Side of New York, among the well-to-do in such cities as Boston and Chicago, and in all classes of society, as shown in a series of investigations extending from Labrador to Atlanta. A similar situation was disclosed by the examinations for the army, where approximately the same proportion of recruits was found unfit for military service because of conditions largely due, directly or indirectly, to malnutrition.

Had the causes of malnutrition been generally understood during the childhood of these men, this physical unfitness could have been almost wholly pre-

vented by the adoption of a simple program insuring normal healthy growth. The five chief causes of malnutrition in the order of their importance are:

1. Physical defects, especially nasopharyngeal obstructions.
2. Lack of home control.
3. Overfatigue.
4. Improper diet and faulty food habits.
5. Faulty health habits.

The requisites for good health in the growing child are few: good air, simple food, rest, and proper exercise. If the causes of malnutrition are removed and these simple requisites for growth are obtained, we have what might be called the essentials of health. These essentials are:

1. The removal of physical defects.
2. Sufficient home control to insure good food and health habits.
3. The prevention of overfatigue.
4. Proper food at regular and sufficiently frequent intervals.
5. Fresh air by day and by night.

With proper planning these conditions can be brought about in the majority of families, and as a result the malnourished child can be made well in his own home. Why then has malnutrition, as a definite condition with definite causes and effects, been so generally overlooked? In the first place, no effective steps have been taken by the medical profession, by the hospitals, or by the schools to examine children for this particular condition, and thus identify the malnourished group.

Until the World War focused attention upon physical unfitness, malnutrition was not generally known to be a serious matter. Moreover, there has been a general misunderstanding of the causes of malnutrition. Physicians, educators, and social workers have accepted, almost without question, the theory that this condition is due mainly to poverty and improper food. Investigation shows clearly that these causes, as well as many others commonly proposed, such as bad air, heredity, syphilis, and tuberculosis, are of secondary rather than primary importance. A third explanation is that parents and physicians are so accustomed to the condition that they pay little attention to it. Because a child is not sick in bed and shows no acute symptoms he is considered well and is so treated. If he falls behind in his studies, pressure at home and at school is increased. If he fails, he is called lazy. Thus a vicious circle is established that only adds to the degree of his malnutrition. It is from the ranks of such cases that the misfits and failures, the physical and nervous wrecks, who make life miserable for themselves and for others, are later recruited. Malnutrition is a clinical entity with characteristic history, definite symptoms, and pathologic physical signs. The malnourished child is a sick child and should be so considered.

The child becomes irritable, tires easily, lacks physical and mental endurance, and exhibits other indications of an unstable nervous condition. Among the physical signs besides underweight are lines under the eyes; anxious expression,

pallor, mouth-breathing and other indications of nasopharyngeal obstruction; the anterior cervical glands are frequently enlarged; there may be fatigue posture, round shoulders, lateral curvature, flat chest, rigid spine, and pronated or flat feet.

How to Identify the Malnourished Child.—As in the treatment and care of infants, a steady advance in weight is one of the most reliable tests of good physical condition, so also throughout childhood the weight curve continues to be the surest indication of proper growth. Unless he is regularly weighed, the child may fail to gain for years without its being noticed. For this reason all children should be weighed at least once a month and oftener if necessary. In a normal child, loss in weight may be an early indication of illness; in an undernourished child, failure to gain means that conditions are unfavorable to growth and should be corrected. The tables in general use in the past have taken age as the basis to compute normal weight. But the attempt to apply this weight-for-age standard leads to practical difficulties at once because of the great variation among children of the same age. After much experimentation the basis of weight for height has proved to be an accurate measure of the condition of the malnourished child. It may be stated as a physiologic principle that a body of a certain height requires a certain weight to sustain it, and the most significant test of a child's physical condition is the relation between his weight and his height, and 7 per cent indicates a reliable minimum. It is a common error to take it for granted that a child will never attain average size because he is supposed "to take after" some undersized uncle or grandfather.

While a child may inherit certain traits from one ancestor, he may, in other respects, resemble another of very different characteristics. It is easy to fall back on heredity. Parents often boast that at ten years the child is wearing a twelve-year-old's suit, but the practical part is, has he the weight to sustain the height? As the child grows, every advance in inches calls for a corresponding advance in pounds.

OBSTRUCTION IN THE NOSE

Obstruction in the nose and pharynx is perhaps the most important of all defects in its relation to nutrition, and its commonest symptom is mouth-breathing. An important point to remember is that the child may keep his mouth closed while receiving the attention of the examiner, and this sign may pass unnoticed. It is best for the mother, not the nurse, to notice this symptom while the child is asleep, at least twice. Enlarged anterior cervical glands indicate, as a rule, diseased tonsillar tissue and subsequent absorption of toxins. Dull eardrums also suggest subacute inflammatory process extending from the throat. Even where children have had several adenoid and tonsil operations, there may be diseased tissue remaining that is walled in by cicatrices, thus preventing drainage. The child's health may be worse as a result of this than it was before the operation. Such infected tissue must be removed before the child is "free to gain."

Sinus infection is more common than is generally supposed. The sinuses of children are small, but infection may occur secondary both to nasopharyngeal obstruction and to decayed teeth.

In extreme cases of malnutrition congenital syphilis should always be suspected as a cause. Therefore, the Wassermann test should be made as a routine matter, especially in institutional cases. X-ray examination of the long bones is an aid in this diagnosis. Pyelitis is not uncommon, especially in girls, and its detection often requires more than one urinalysis. An x-ray examination of the chest may disclose obscure tuberculous lesions, and the von Pirquet test should be employed to rule out tuberculosis.

MENTAL DEFICIENCY

Malnutrition does not cause mental deficiency, but it does result at times in a mental retardation closely resembling the actual state of defect. Such children do not have the strength to show interest in their studies, and they falter and fumble at their tasks in a way that is exasperating to those in charge of them. Considered lazy, they are told, "Your fingers are all thumbs," or, "You never get anything straight," or, "If you have any brains, why not use them?" Such expressions merely add to the child's distress and entirely fail to improve this condition, the real cause of which must be determined. The malnourished child is frequently backward, forgetful, unhappy, oversensitive, and unreasonable both in his likes and his dislikes. He may show signs of irritability, inattention, and lack of concentration and yet be entirely normal in his mental development. It must be remembered that the unmanageable child is more often *ill* than bad or deficient. Fretfulness from rickets, dullness and lack of memory from adenoids, irritable peevishness from digestive disorders, and the abnormal mental reactions of overfatigue, all yield to treatment when their cause is once recognized, and a mental transformation frequently takes place along with the physical improvement. Even where the child is found mentally defective, he will be happier and his mental condition will improve if his nutrition is brought up to normal. Home conditions and early training in self-control are important factors in leading the child to normal behavior. A case is reported in which a boy was so utterly defiant of parental authority that he would actually fight his mother with feet and fists. It was thought certain that the child was mentally deficient, but before this explanation was accepted as final, it was decided to try what discipline and a change of environment would do. He was accordingly sent to a well-organized boys' school, and at the end of the year the master reported, "He is a little gentleman."

QUESTIONS ON MALNUTRITION

Overfatigue.—What part of the child's day is given to play, to work, and to school? How long is he actually in bed? How much of that time is he asleep? Has he learned to rest when not sleeping? What time does he go to bed? Does he rise in time to get to school promptly without hurry or worry?

Home Conditions.—What are the requirements made upon the child as a member of the family or household? Does he receive too much attention from older people? Does he receive enough? Does he like to play alone? Who are his chosen associates? How is he punished? Is he obedient? What regu-

lar engagements has he in the way of Scout duties, clubs, music, or dancing lessons, gymnastic training, lessons in foreign languages, or religion?

Food Habits.—What is the average number of minutes spent at each of his meals? What are the interests that hurry him away from the table? Does he wash down his food with liquids? Does he drink tea, coffee, ice water? How much money does he have to spend for candy? Has he any marked likes and dislikes in the way of foods?

Health Habits.—How much of the child's day is spent in the open air? What are his sleeping conditions with reference to open windows, drafts, light, etc.? Does he sleep alone? Is he disturbed by other members of the family who retire later or rise earlier? Does he have a movement of the bowels at a regular time every day? How often does he bathe?

These questions are necessary to outline a progress of health essentials. The growing child requires open air, sufficient food for growth, adequate exercise, and proper rest. Yet with all these requirements provided, many children nevertheless fail to develop properly and become seriously malnourished. Open air will not help the child unless he can breathe it freely into the lungs. Sufficient food may be available and it usually is, but if food habits are wrong he will still be undernourished; it is not so much what a child eats but what he assimilates that promotes growth. He may have opportunity for exercise and rest, but unless properly employed these in turn fail to insure normal growth and health.

Home Control.—Malnutrition can often be traced to faulty home conditions, and in all cases the home is an essential factor in successful treatment. The physician can outline the important points of a health program, but the success will be in proportion to the degree of cooperation with which it is carried out by the parent and the child. It is well to consider what is the prevailing atmosphere of the home. Is it positive or negative, a place of hope and stimulation or one of repression and fear? Does its tone indicate hurry, injustice, worry, deception, or the opposite of these undesirable qualities? Do the children hear constantly, "Don't do this," and "Don't do that," or are they encouraged to try things out for themselves with a minimum of caution, but with help given freely when necessary? Good government in the home, as in the state, makes for happiness and health. The child must be made to take a personal interest in his health. He should not follow the health program merely as a matter of routine and obedience, but should be so convinced of its value that no external discipline is needed to make him carry it out. Where there are well-regulated nutrition clinics, a child learns to remind a forgetful mother of the time for lunches and rest periods, another will ask for more air in the sleeping room; others give up coffee, tea, ice water, and teach themselves to like foods for which they formerly had an antipathy. If the weekly weighing is made something of a ceremony, and the child sees that both parents are really interested in his condition, he will respond with an unusual degree of confidence. Much of the self-indulgence that wastes a child's life grows out of the self-indulgence of other people; the mother who lets her child "have its own way" is often gratify-

ing her own pleasure. By making a pet of him she seeks to make him dependent solely on her for his happiness and comfort. She encourages him to come to her with little ailments and symptoms and sympathizes with his sensitiveness instead of teaching him to meet small hurts and disappointments with self-control.

The problem of the spoiled child is too often the problem of the spoiled mother. Many cases of malnutrition are a direct result of overindulgence for which the spoiled child pays a heavy penalty. The malnourished child is likely to be the only child, or else the youngest or the oldest, the pet who has the upper hand of the father and the mother. It is evident in many homes that the child is in control, and the parent his willing or unwilling slave. If he does not wish to do a thing, he has no idea that there is any reason why he should, or any power to compel him. Among the poor we find many children who are kept from normal growth by worry over the payment of rent, the care of younger children, the fear of the father's losing his job.

As to the punishment of the child, it should never be forgotten that punishment is always an individual problem. A little study of the child's nature will show how to be just and fair to him. The right kind of punishment tends to do away with the necessity for its repetition, and the aim should be to make it easier for the child to do what is best for his health rather than to have his own way and do himself harm. In the ideal home there is a healthy, normal attitude that seems to keep the child away from acts that call for punishment. When the need does come, it should be met in a constructive spirit, with no evidence of retribution or bad temper. Never withhold an expected punishment until the next day or send a child to bed without supper. Taking away privileges is a better method of discipline. Offer a reward; malnutrition clinics give gold stars. In the complicated conditions of modern life parenthood is more than ever an art calling for great skill and judgment. Lack of home control is one of the principal causes of malnutrition, but it is, in fact, directly or indirectly responsible for all the others. If there are physical defects present, it is the parent's duty to see that they are removed; faulty food and health habits must be corrected in the home, and overfatigue, whether from work, study or play, can be avoided only by the watchful supervision of thoughtful parents.

Overfatigue.—Continued experience in the treatment of malnutrition leads to the belief that there is no more responsible cause for this condition than habitual overfatigue. It is necessary to distinguish between the fatigue that is the natural result of exertion, from which there is a quick recovery, and overfatigue which carries the child each time farther from his normal condition and makes his return to health more difficult. In this case the child is either overstimulated so as not to know he is tired, or else he has a disinclination for exertion of any kind, and a feeling of being dragged out and exhausted. The problem of overfatigue has been one of the most difficult problems of the physiologist. The weight curve is the most valuable test available to show the effect of fatigue. No one experienced in the care of animals allows them to be over-

exercised during the growing period. A valuable colt is never entered in long races until maturity, and it is recognized that a horse can be killed by over-driving or by being fed and watered immediately after severe exercise. Do we take the same care of the growing child? He is allowed to come to the table in a profuse sweat and with dirty hands.

There are many causes of overfatigue. The child will naturally overdo, and the brighter and more active he is, the greater the danger. The spirit of competition and the desire to stand well with his associates lead him to tasks far beyond his strength.

Adults seldom appreciate how much energy and strength are required in simply growing. From the age of two to six years the child is likely to be made the pet of the family, each member in turn entertaining him, seldom leaving him alone, and often interrupting his proper routine to gratify the wish to be with him. The amount of sleep needed varies with the individual, but every malnourished child should spend at least ten to twelve hours in bed every night. Some get their best sleep early in the night, while others sleep better in the morning. In addition to the night's rest, regular rest periods in the middle of the morning and the middle of the afternoon are recommended. The physician should be the judge. Remember, fatigue interferes with absorption, and the child will benefit in both appetite and digestion if he has a short rest period before eating. Since light is a powerful sensory stimulus, there should be no light in the sleeping room. Children should not be permitted to sleep in underclothing that has been worn during the day. Their sleep should not be disturbed by the later retiring or earlier rising of other members of the family.

Diet and Food Habits.—It is universally recognized that diet is an important factor in nutrition. The feeding of infants has become so thoroughly standardized that the amount of milk and other foods required is now prescribed with great exactness. What is not sufficiently recognized is that other factors of equal importance must be controlled before malnutrition can be removed and proper growth established. Attention must be given, not only to the character of the foods selected but also to the fuel value of the amount taken and to the child's habit of eating. The problem of an optimum or ideal diet is receiving the attention of the chemist, the biologist, and other workers in this line, but it has not yet been discovered just exactly what amount of each food element is needed by the growing child. We are told about vitamins, and even were it known how much of these is needed, it would still be necessary to determine under what conditions they are best absorbed. Few investigations, other than clinical research, have yet been made to determine the influence of physical defects, fatigue, and toxins on absorption. Emotional reactions, such as fear, anger, hurry, worry, must be taken into account as affecting the child's power of assimilation.

Degerminated foods, such as milled flour, polished rice, and artificially prepared products, in causing a deficiency of value constituents have been brought to our attention as harmful. Our present knowledge indicates that if a child takes a sufficient amount of the usual foods of the average American table, in-

cluding a pint of milk a day, he will have all the dietary essentials for proper growth, and the physician should be consulted as to extra cod liver oil and viosterol with proper dosage.

Balanced Diet.—It is not necessary to provide an unusual or peculiar diet for the malnourished child. Elaborate dishes and delicacies intended to tempt the appetite are of less value than are plain wholesome food. Experience shows, fortunately, that children thrive on simple and comparatively inexpensive foods: milk and milk products, whole cereals, corn, rye, and whole wheat bread, fish and the cheaper cuts of meat, vegetables, such as potatoes, onions, carrots, spinach, tomatoes, turnip salad, fruits and berries in season, with plenty of the juice of citrous fruits, especially oranges.

Sweets.—Sweets are not harmful if taken at proper times and in moderate amounts. There is no evidence that sugar or glucose is injurious provided it is diluted and balanced by proteids and other foods. A few pieces of plain candy taken as a dessert will add to the number of calories without impairing the digestion.

Candy.—Candy is clear sugar or glucose, however, and when taken on an empty stomach acts as an irritant, causing indigestion and consequent loss of appetite. The taking of too much sugar leads to a craving for sweets and a disregard for the natural flavor of other wholesome foods.

Liquids and Mastication.—The child should be encouraged to drink plenty of water, cool, but never iced. This may be taken before and after meals, and during the meal, provided there is no food in the mouth at the time. Food should be chewed as long as there is taste in it, and should be moistened by the natural secretions of the mouth, which aid digestion. The habit of washing down food with liquids leads to imperfect assimilation, and where the practice has been established, all liquids should be placed out of the child's reach until the habit is broken.

Remember, milk is a food, and therefore should not be used to quench thirst. It should be taken slowly, on cereal or with bread and milk, using a spoon. Fast eating should never be allowed (even for the grown-ups), and every meal should take at least twenty minutes by the clock, and the child should sit through to the end with the rest of the family or in the nursery.

Health Habits.—We should try to realize that Nature always makes for health, and usually succeeds unless there are conditions too unfavorable for her to overcome.

Fresh Air.—In the treatment of malnourished children we have found that those who sleep on porches or under window tents gain in weight faster than those who sleep in a room with several windows open. It is of equal importance that as much time as possible should be spent in the open air during the day, and the hours of sunlight are particularly desirable. Open-air schools are wonderful for the malnourished, for it has been proved that many lose what they gain as soon as they are placed in the shut-in type of schoolroom. Open-air schools also seem to prevent the spread of contagious diseases, especially in-

fluenza. Where we have only windows, it is best to pull down the upper sash about halfway and to push up the lower sash the same, so as to try to create a current of air. The only way to have real fresh air in every portion of the room is to have a strong cross current, to blow the stale air out and to let the fresh air in. An electric fan is better. Most beds are placed in a corner of the room where little or no fresh air reaches. This I term a *dead corner*. You can readily see the practical point.

Drugs Unnecessary.—Never give a drug, even a laxative or tonic, unless it is ordered by the physician. The movie and theater are unsuitable forms of entertainment for the growing child on account of the bad air (in many of them), danger of eyestrain, overstimulation of the nervous system, and fatigue from prolonged attention.

It has been rightly said that one who is well at eighteen years will probably remain well the rest of his life. It should be recognized that it is as easy to form good health habits as bad ones.

FREDERIC T. MURLLESS, JR., D.D.S., HARTFORD, CONN.

As a result of investigation and inquiry, I have been using for some time an effective anesthetic which may be applied to the gum without discomfort or without causing delay.

The cocaine dissolves readily in the phenol, and gives a clear solution which is about the consistency of glycerin. In this proportion, when dissolved, there remains a small portion of unsaturated cocaine at the bottom of the bottle. The two drugs balance and limit each other to a desirable degree, namely, the phenol is no longer escharotic, does not blanch the gum, and does not destroy the mucous membrane; while at the same time the penetration of the cocaine is restricted to the surface tissues, and its influence is purely local.

This medicament applied in the same manner and used in slightly larger quantity is a dependable resource in removing overlapping gum tissue from partially erupted mandibular molars and premolars, and, as it is slightly styptic as well as anesthetic in its influence, the hemorrhage from such operations is reduced to a minimum.

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For the operation of removing overlying masses of gum tissue and exposing the mandibular molars, I have devised a sickle-shaped scalpel that is more effective in my hands than any I have been able to procure in the regular surgical or dental lines. The lancet is illustrated in Fig. 1.

The procedure is as follows. After the surface of the gum mass to be excised is wiped with a minute quantity of the cocaine-phenol mixture for sixty seconds, and the unabsorbed portion is removed as already described, an ordinary straight scalpel such as a Bard Parker No. 12 is first used with distal thrusts buccally and lingually in the lines of the molar cusps. The mass to be removed is thus outlined by incisions which should reach slightly beyond the distal outline of the tooth, and the sickle-shaped scalpel is then used with a bucco-lingual cut to sever the mass for removal. In making this final incision, the sickle-shaped scalpel should be directed so that the cut is made from behind with a downward and forward sweep to include the tissue well toward the depth of the distal contact point of the tooth, so that the remaining gum tissue when

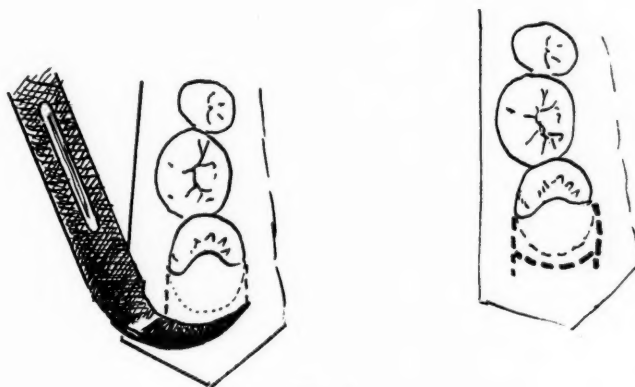


Fig. 1.

healed will lie below the coronal periphery of the tooth. By means of the sickle-shaped scalpel and the anesthetic used as described, the gum mass may be removed painlessly without dragging or leaving the wound with torn or ragged margins. There will be practically no hemorrhage, and healing will be immediate.

For uncovering partially erupted premolars, the procedure is similar and is equally free from sensation.

If dulled by contact with the tooth, the sickle-shaped scalpel may be re-sharpened with a small round oil stone in the engine handpiece, with plenty of vaseline used on the blade as a lubricant.

With each suggestion of departure from any familiar means or method, one naturally measures the proposal in terms of one's experience. This method of approach to these items of extremely minor surgery has been evolved from an accrued impression of the limitations of the available proprietary anesthetic mixtures which in practice seem too superficial and too temporary for the purpose. Ethyl chloride spray is both temporary and unpleasant in its application. Novocaine tends to affect the tissues more deeply and over a broader area than

necessary, while its prolonged anesthetic effect is always remarked by the patient. The odor produced by the electrocautery is unpleasant and alarming, arouses fear, and produces an impression in the child's mind which is not soon forgotten.

With a little experience in using the phenol-cocaine mixture, the operator can safely expect freedom from pain, no adverse after-effects, and no unpleasant impression in the mind of the patient. In fact, I have often resected sizable portions of gum tissue without the patient's knowledge of the nature of the procedure, without after-pain, and often without arousing the patient's curiosity.

As may be imagined, the use of this anesthetic mixture may well be expected to have many applications outside the mouth, on occasions where complete anesthesia is desired in minute areas.

43 FARMINGTON AVENUE

PATHOLOGY AND PEDODONTIA

FRED W. WEBSTER,* D.D.S., LINCOLN, NEB.

IN THE consideration of pathology as it pertains to pedodontia many important matters might be discussed. The increasing interest in the subject of pathology means, it seems to me, that this infant branch of dentistry is entering upon its problems at a most fortunate time. The past thirty years, especially the past decade, have shown marvelous strides toward biologic thought in dentistry, with many of the accepted theories of the past discarded and dental research placed upon a sounder scientific foundation. Successful clinical treatment must be based upon sound premises, scientifically proved, and empiricism and pseudoscientific dogmatism must be discouraged.

To appreciate this change of attitude one need only to scan a modern dental publication, a 1935 *Dental Cosmos* or *Journal of the American Dental Association* and one of 1910.

It seems propitious that this important new branch of the profession spread its wings at such a time in order that its future development may have a secure beginning free of the prejudices and bigotry of the past. The prevalence of oral disease and its many serious sequelae place this as one of the great medical problems of today, and its solution may be found within this particular branch of dentistry.

In dealing with the clinical aspects of children's dentistry, the technical problems are of course important, but the real service will depend upon the operator's ability to visualize the possible end-results of his treatment, and not chance the future well-being of the patient.

Fifteen or twenty years ago it was good practice to open an infected pulp through the crown of a deciduous tooth, thus establishing drainage and giving relief from the painful symptoms, allowing the septic tooth to remain as a space maintainer for the unerupted permanent successor. Such a procedure in the light of present knowledge of infection is little short of criminal. The fulminating virulent alveolar infection with its concomitant symptoms is necessarily one of grave concern, but it at least has the one virtue of the rattlesnake, that of announcing its presence; whereas the low grade, symptomless infection may in the end be much more destructive.

Irons¹ contends that the popular assumption that the child's resistance is greater than that of the adult is wrong. Boyd² states, "Rheumatic fever is the major agent in cardiac pathology." The symptoms of rheumatic fever in children are usually not pronounced. It is most likely an allergic reaction "to the presence of streptococcal foci. It appears probable that this focus is usually

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in the mouth and nasopharynx, teeth, tonsils, and nasal sinuses." The end-result of rheumatic heart disease is usually a chronic myocarditis, a permanently damaged heart muscle.

Rosenow³ also concurs in the theory that the great danger of a low grade focus lies chiefly in this tissue hypersensitization by the elaborated toxin or filtrable virus. Dennis⁴ produced in experimental animals a true neutropenia or agranulocytic angina by placing within the abdominal cavity a parchment capsule of inoculated culture medium. The capsules caused no local infection, and the symptoms were produced only through action of the substance permeable to the intact capsule. Incidentally, he found that the most pronounced reactions were those produced by the *Streptococcus viridans*.

According to Billings⁵ these oral pathogens may also be swallowed with the food, and some may pass the barrier of the pylorus and reach the favorable environment of the intestine. Covey⁶ reports that recent investigators sustain this contention and also that the mode of invasion of these organisms through the intestinal wall to the lymphatics has been demonstrated. The argument that the loss of a deciduous molar may cause malocclusion of the permanent teeth does have some weight, although it might be better to assume that the tooth was lost when the vitality of the pulp was lost. An artificial space maintainer is not so dangerous as the nonvital tooth which may be a focus maintainer.

Other disturbances of the child are the acute and subacute infections of the gingival and oral mucosa. The acute ulceromembranous stomatitis may be a frank Vincent's infection or more likely a mixed Vincent's and streptococcus. These cases usually have a sudden onset with temperature as high as 104° with submaxillary and cervical adenitis. The gingival tissues are swollen, often even with the occlusal surfaces of the tooth crowns, highly inflamed, tender, painful, hemorrhagic, and covered with a dirty grayish membranous-like exudate. Patches may involve the mucosa of the cheeks, palate, and fauces. The lips and skin of the face may also be involved. Eating solid or semisolid food is impossible, and even liquids, especially hot or acid, may be intolerable. The pathology of the disease locally is that of a symbiosis of the fusiform bacillus and Vincent's spirillum usually associated with streptococci. It is an ulcerative process and may cause more or less permanent destruction of the soft tissues. Aspiration of septic material may cause pulmonary abscess. The bacillus is probably the more virulent organism, according to Prinz,⁷ since biopsy shows this organism deepest in the tissues but never below the basement membrane.

In all cases of acute stomatitis a differential blood count should be obtained, because an ulcero-membranous angina is often associated with certain blood dyscrasias, probably as a superimposed infection on tissues of greatly lowered resistance. It is often a terminal condition in septicemia. The following cases are interesting:

CASE 1.—September, 1930, W. E., aged four years. Temperature 102.8°. History—measles in March, 1930. Never very well since, but not confined to bed. Enlarged cervical glands for two weeks. Stomatitis for one week.

Examination of mouth revealed an extensively ulcerated mucosa of a typical Vincent's type. The left mandibular deciduous molar was abscessed and was draining through a buccal incision. Smears were positive for fusiform bacillus and spirillum. Blood examination: R.B.C., 1,912,500; W.B.C., 14,900. A differential count a few days later showed polymorphonuclear leucocytes only 5 per cent and later entirely gone. The child died four weeks later. Apparently this case was a typical Vincent's infection. A dentist in another city had referred the case to a pediatrician in Lincoln after he had lanced the abscessed molar but had refused to extract the tooth at the request of the attending physician. This was a case of agranulocytosis or neutropenia for which no known treatment would have been of any avail, and extraction at this time probably would have precipitated a rapidly fatal collapse. This dentist certainly should be commended for his diagnostic ability. A common error is to make hasty decisions and to see only the apparent conditions.

CASE 2.—A boy, nine years of age, developed an abscess about a mandibular right deciduous second molar. The dentist lanced the abscess and later extracted the tooth. The swelling, however, persisted with continual suppuration. An x-ray film of this area taken a few months later revealed a large follicular cyst about the crown of the unerupted first premolar. This tooth was lying horizontally with the crown directed distally. The cyst cavity, 25 mm. in diameter, was below the area of the extracted second deciduous molar. This was a case in which any of us would most likely have made the same error and illustrates the importance of knowing more about a case before treatment.

Other interesting pathologic conditions are the newgrowths or neoplasms. The most frequent type of malignancy found in and about the mouth is of epithelial origin, the carcinomas, but these conditions are more often found later in life.

The sarcoma is the usual malignancy of childhood and, though fortunately not common, is unfortunately usually rapidly fatal. Since in most instances these cases are first seen by the dentist, the dentist's responsibility is clear, for early recognition is the only chance for recovery.

Inflammatory conditions may obscure or simulate a neoplasm. Such a case was that of a little girl eleven years of age, the daughter of a dentist. About three or four months before I saw her the father had cauterized a slightly hypertrophied interproximal gum papilla between the mandibular right canine and the first premolar. This had recurred and was now about the size of a small pea, sessile, very vascular, but not painful. The biopsy showed this to be a benign giant-cell epulis.

Abnormalities of the deciduous teeth are uncommon; though occasionally fusion of a mandibular central incisor and lateral incisor may be observed. The unexpected, however, is just as important as the usual so far as the particular individual is concerned. The responsibility is the dentist's, and no case is properly handled unless all necessary and available means are used in making an examination. The fact that the permanent maxillary lateral incisors and the mandibular second premolars are occasionally congenitally absent requires cer-

tainly that these areas at least should be x-rayed before orthodontia is instituted. A supernumerary tooth in the anterior median line of the maxilla may prevent the approximation of the central incisors.

An x-ray film of a swollen painless area over the maxillary left deciduous molars of a child ten years of age showed a large densely calcified area and above this the unerupted second premolar invaginating the floor of the maxillary sinus. The postoperative examination showed an almost perfectly round cementoma about the size of a small marble attached to the deciduous second molar.

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DENTISTRY FOR CHILDREN*

CLARENCE O. SIMPSON, M.D., D.D.S., ST. LOUIS, MO.

FORMERLY it was customary for children not to know chickens had anything but necks, or that dentists had anything but forceps. Since the access of children to the first table and first aid, they may be given dental treatment which was too generally considered unnecessary for first teeth.

With the advanced parental education of women's clubs and men's booster luncheons, children are receiving almost as much attention as household pets in the city, and livestock in the country. Mothers who study child psychology and fathers who subscribe to "service first" slogans might apply more psychology and service to their own children.

Too often parents in self-pity or a bid for sympathy exaggerate their dental pains and dental operations before children, which creates an unreasonable fear of the dentist in their impressionable minds. When the teeth are neglected until they are painful, children face the dilemma of enduring the toothache or the torture of the dentist, which is a pitiful mental strain.

Some children are threatened with the punishment of being taken to the dentist, instead of being taught that dental treatment is to prevent or relieve pain. It is not strange that children must literally be dragged to the dentist with tears and wails after suffering from toothache and being frightened at the prospect of the visit.

Under the most favorable circumstances children cannot be expected to readily tolerate unpleasant and tedious duties. Any surgical or medical treatment is given to them with considerable difficulty and force. Dentists are especially hindered in rendering assistance when children are afraid and when the teeth are sensitive. Each condition tends to aggravate the other, until compromise in treatment usually becomes necessary.

Also, the peculiarities of the baby teeth interfere with thorough operations. They are small, the pulp or nerve is rather near the surface, and they are almost impossible to cure when abscessed. On account of the difficulties which parents do not always consider, dentists should be compensated for the time spent in caring for children rather than for the actual value of the operations.

A plan can be followed which will eliminate the difficulties and work to the advantage of children, parents, and dentists. By considering the effect of early impressions and arousing their curiosity by playful reference to dental operations, the first visit of children to the dentist can be made attractive. This should be between the ages of twenty and twenty-four months.

If the teeth have been given the proper daily care, probably the only service required from the dentist at this time is examination and polishing. The ex-

*Radio broadcast.

Reprinted from the Journal of the Missouri State Dental Association.

perience will be enjoyable to children if the dentist cooperates, and one should be found who understands how to manage children. It is not essential that children be taken to the parent's dentist, who may lack the desirable tact and manner.

The visits should be repeated at regular intervals, two or three times each year, so that any needed repair can be easily made before harm occurs. When children are five years old, they should have an x-ray examination every year or two, that the development of the permanent teeth may be observed.

The care administered during childhood and youth does more to establish the dental history of each person than later developments. Almost every one bears traces of early dental neglect and should extract some consolation from the unfortunate experience by earnestly promoting dentistry for children.

Any omission in the protective routine reduces the prospect of preserving the teeth, and the benefits justify consistent efforts. These ounces of prevention not only are worth pounds of cure, but also save tons of regret.

THE MURRY AND LEONIE GUGGENHEIM DENTAL CLINIC*

ANNUAL REPORT, 1934

SUPPLEMENTARY STATEMENT

THE accompanying report presents the statistical record of the Clinic for its third year of operation in the present building. The children from 22 public schools, 10 day nurseries, 12 parochial schools, located in the vicinity of the Clinic, are receiving dental care. First consideration is given to the public schools which are served over as great a radius as the present bus service (provided by the Board of Education) will permit.

Analysis of new caries in recalled patients has shown that a considerable number of these cavities originate in occlusal surfaces of posterior teeth previously rated as immune. It has therefore been necessary to revise the policy regarding prophylactic operations on these teeth. Areas which are obviously food- and bacteria-retentive because of the angle of incidence of cusp slopes have been found to be susceptible regardless of the apparent perfection of enamel lobe coalescence; teeth exhibiting this condition are treated by placing prophylactic amalgam fillings. This practice will largely replace the silver nitrate disclosing procedure described in the last annual report. New cavities in permanent molars show a proportion of 94 occlusal to 6 proximal; in premolars the proportion is 81 occlusal to 19 proximal.

Attention is again called to the figures on caries in preschool children. Gross percentages are given and also the percentage of children having 7 or more cavities. It has been found that preschool children with 7 or more cavities have an average of at least one tooth requiring extraction because of pulp involvement. The early and extensive incidence of caries in children below school age constitutes a distinct problem in community health. Efforts so far made to induce a larger number of parents to bring preschool children to the Clinic have met with so little success as to force the conclusion that special measures will have to be devised to bring this very important group in the population under dental observation and care. Obviously dental care instituted at the age of school entrance will continue to be expensive and unsatisfactory under existing conditions.

During the past year pulpotomy has been adopted as a procedure for carefully selected cases in both permanent and deciduous dentitions where carious exposure of the pulp has occurred. Experimentation is proceeding with the object of developing a suitable pulp chamber dressing for these cases. Results obtained so far have been encouraging.

*422 East Seventy-Second Street, New York, N. Y. John Oppie McCall, D.D.S., Director.

In the Oral Surgery department there were fewer patients treated during 1934 than in 1933. Extractions of deciduous teeth were relatively increased but extractions of permanent teeth were relatively decreased. It will be noted that under Special Operations, apicoectomy appears with a total of 19 operations. These operations are, as a rule, performed immediately after pulp canal filling in cases showing definite periapical radiolucency. Results have been very satisfactory as judged by available criteria.

The students in the School for Dental Hygienists continue to give prophylactic treatments in the Clinic and at the Lenox Hill Hospital. Their services in the latter institution are regarded as a valuable part of the care of certain types of cases, notably in the preparation for general operations.

The course for training dental assistants, mentioned in the last annual report, is being continued. This course offered by the New York City Board of Education is given partly at the Clinic and partly at the Central School of Business and Arts. Two classes are enrolled annually, each course being concluded in one semester.

REPORT FOR PERIOD FROM JANUARY 1 TO DECEMBER 31, 1934

Total patients registered in Clinic to Dec. 31, 1934	16,943
New patients, 1934	3,836
Age 1 to 5	676
Age 6 to 12	2,883
Over 12	277
Total patients—new and old, 1934	11,475
Total visits to Clinic	59,078
Total visits to all departments	71,900
Total cases completed	3,951
New patients	1,404
Recalled patients	2,547
Discharged (over age limit or moved from district)	2,727
Readmitted	162

CARIES IN PRESCHOOL PATIENTS BY AGES

AGE	PER CENT WITH CAVITIES	PER CENT WITH 7 OR MORE CAVITIES*
2	47	13
3	79	37.5
4	89.5	56
5	96.5	60

Oral Diagnosis Department	
Total visits	17,923
Total x-ray pictures	21,838
New patients, as above	3,836
Free from caries	88
Percentage of patients with caries	97.7
No operative work needed	71
Total caries	39,212
Marked gingivitis	278
Orthodontia urgently needed	20
Referred to rhinologist	233
Recalled patients	4,470
Free from caries	28
No operative work needed	373
New caries	9,406
New caries per patient	2.3
Recurrent caries	294

*See supplementary statement.

Operative Department		
Total visits		43,926
Prophylactic treatments		13,076
By dentists	1,155	
By hygienists	8,976	
(By hygienists in hospital	2,945)	
Fillings		53,894
Temporary		
Simple*	1,545	
Pulp capping†	449	
Permanent‡	51,900	
Fillings polished (not surfaces)		20,189
Cavity preparation		3,221
Silver nitrate treatment		3,785
Root canal treatment		454
Root canal filling		64
Pulpotomy		109
Gingivitis treatment		440
Occlusal adjustment		622
Oral Surgery Department		
Total visits		9,517
Extractions		12,767
Deciduous	10,986	
Permanent	1,781	
Postoperative treatments		1,766
Special operations		121
Apicoectomy	20	
Curettement	1	
Drainage of superiosteal abscess	13	
Surgical removal of		
cyst	1	
cystic growth on lower lip	1	
fibrous tissue	1	
gum flap	48	
labial frenum	8	
lingual frenum	2	
malposed tooth	9	
papilloma on tongue	1	
retained root	6	
salivary calculus	1	
supernumerary tooth	9	
Anesthetics		6,975
Local	4,600	
Procaine	4,310	
Ethyl chloride	290	
General	2,375	
N ₂ O and O	2,150	
Ethyl chloride	225	

*Simple temporary fillings are chiefly sedative dressings inserted in teeth found to have exposed pulps and requiring extraction.

†Pulp capping is done only in teeth with nearly exposed pulps; when actual exposure occurs, pulpotomy is performed.

‡Each surface of a tooth involved counts as one filling.

Department of Orthodontic Abstracts and Reviews

Edited by

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Tooth Form. A Syllabus by Dr. Russell C. Wheeler, 1935, Ann Arbor, Edward Brothers.

The text of this book, which deserves especial notice, is remarkably terse and is amply illustrated. Concise methods of drawing tooth forms on millimeter paper, "plaster sculpture" by means of which teeth are carved to true tooth form, and reference drawings in three dimensions cover the subject admirably, yet the whole monograph occupies only thirty-one pages.

There is nothing in dental practice more fundamental than an appreciation and a precise knowledge of tooth form. There is no phase in dentistry in which it is not as basic as a sound knowledge of biology is to an appreciation of growth and development of the living organism.

Since Angle called so vividly to the attention of the dental profession the vital importance of correct relationship of all the inclined planes of the cusps of teeth, that each tooth must take up its proper amount of space in the arch and that the cusps must interdigitate correctly with their opponents in the other jaw, dentistry has become more truly a science. This conception affected all branches of prosthetic dentistry as well as operative dentistry.

The reviewer is glad this fine syllabus has been published; it is a little gem, a classic.

Several years on a State Board showed to the writer that there is great need for a thorough knowledge of tooth form. I once asked, in an examination, "What is the marginal ridge?" Hardly one-half of the students knew, and only one-third gave a satisfactory answer. How can men practice good dentistry if they do not know correct tooth form?

It will please the writer very much if this work is generally accepted by teachers and students. It cannot be commended too highly.

Albert W. Crosby.

The Business Conduct of an Ethical Practice. By Dr. S. Joseph Bregstein, 1932, Dental Items of Interest Publishing Company.

According to the author, commercialism is no longer considered exploitation. "It embodies the rendition of true service." For this reason considerable recognition has been given to dental economics in recent years. Experience has shown that if the principles of scientific management are recognized, most gratifying results are obtained.

PSYCHOLOGY IN DENTISTRY

Psychology in dentistry is the first topic discussed. It has to be considered in the physical arrangement of waiting and operating rooms, in the environment of the office, its general aspects, and its reaction upon the patient. Correct psychology must also be used in all dealings with patients. One of the warnings is: do not criticize another dentist's work! The second important thought is to learn to appreciate people and to make them feel important. The third matter of correct approach is the proper use of associations in making people do what we want them to do by linking it directly with what they already desire. In conjunction with psychology, the characteristics of human personality traits are explained. The three factors which are most influential in producing desirable personality traits are: physical appearance, mental capability, and emotional attitude.

PEDODONTIA—RADIOGRAPHIC DIAGNOSIS

The chapter on pedodontia is opened with a quotation from the late Herbert A. Pullen. "It must be remembered that the child lives in a little world of its own, a world of effervescent joy and happiness, a combined mixture of birthdays, bedtime stories, candy and cake, ice cream, picnics and games." The necessity for children's dentistry is explained to the parents, and the importance of the prevention of decay is stressed. The management of the child is more successful if the parents are not present in the dental office, as children usually behave better with strangers. Radiographic diagnosis of all patients—children as well as adults—is termed a condition sine qua non for good dentistry. For numerous reasons, such an examination will obviate a great many pitfalls, disappointments, and disagreeable controversies with patients later on.

DENTAL ASSISTANT

As the dentist sells only his services which are measured in units of time, nothing must be permitted to take up his time during office hours. A dental assistant and secretary is, therefore, necessary for a successful practice. She will spare the doctor distractions from telephone calls, mail deliveries, and stock salesmen, and she will make the patients feel that they are receiving the maximum care. Among her duties are the arranging of terms for payments, collections, and bookkeeping.

LETTERS AND RECORDS

A comprehensive chapter deals with letters and records used in the daily office routine. It contains samples of letters concerning collections, broken appointments, recalls to the office, services for children, prophylaxis, appreciation of services, and others. A simple and efficient method of record keeping is recommended by the use of a card system (with illustrated forms) and a daily production sheet.

PRACTICE BUILDING METHODS

In the following chapters, several methods are suggested for increasing the dentist's practice. They include the delivery of better dentistry, education of

the public, personal interest and appearance, membership in clubs, advertising through pleased patients, pain elimination, the keeping of office statistics, the arrangement of office hours, arriving at proper fees, and many other devices.

The economic distress which professional men have suffered in the past years has forced them to pay greater attention to the problem of office management. In doing this, they have many times been handicapped either by a lack of knowledge of business methods or by a fear of overstepping the bounds of ethical conduct. To every one who finds himself in this dilemma, Dr. Bregstein's book will be of great assistance. He has handled a delicate subject matter with much common sense and tact, and, perhaps with the exception of some of the more drastic form letters, even the exacting reader will find few statements to which to take exception.

E. N.

The Forum

Articles for this department should be sent to Dr. Albert H. Ketcham and Dr. William R. Humphrey, 1232 Republic Bldg., Denver, Colo.

Visual Presentation of Dental Problems to the Patient*

It is not the purpose of this paper to be exhaustive, but only suggestive of the advantages of visual presentation. We all experience daily a definite feeling of verbal inadequacy when attempting to describe to a patient his dental problems. We have a nomenclature consisting of technical words and phrases, which, while full of meaning to us, have little or no meaning to our patients. Why then, do we persist in imposing our professional tongue twisters upon our patients? Through diligence and experience, we all have learned to describe a certain dental problem to the patient in language that he comprehends. We all know how difficult this undertaking is, and we know how many times we fail to impress the patient with the thought we wish to convey. We attempt to convey, through words only, a mental image. If we succeed in our attempt, the patient has been given the mental image—the visualization we have transmitted by words.

An old Chinese proverb tells us that "one picture is worth 10,000 words." Even discounting by a zero, or two or three, the tribute rendered this precious sense of sight still remains significant and convincing.

Do not abandon the use of words. Rather, let your visual illustrations give your words point and weight.

With the idea in mind of a simpler way to show the patient what should be done for him, the following clinic was constructed, out of material which has passed through the office of every practitioner. No originality is claimed as to the material itself. The arrangement of this scattered material in sequence forms one way to present and sell dental service to your patients. The various branches of dentistry have been taken up separately, and a story in sequence has been built around each of them. The patient can then visualize the cause of his trouble and the step-by-step procedure necessary for the treatment of his particular case.

The stimulative advantage of this illustrative method of approach is almost inconceivable. There is a fusion of the mind of the dentist and that of the patient with regard to the latter's dental problem. He has become dental conscious, and a spirit of appreciation and cooperation follows. He has become intimate with his dental problem—an actor *in*, rather than a spectator *at*, a drama.

*A discussion presented before the Colorado State Dental Association at Estes Park, June 24-27, 1935.

Some patients, you will agree, believe that a cleaning is a cleaning, a filling, a filling, and a denture, a denture. This idea must be broken down. For some time a great need has been felt for some way in which to make the patient more dental conscious, some way to show him dental values—some way to put health first, and fee second. Such scrapbook illustrations have helped very much to accomplish these things.

Being entirely convinced, by the visual illustrations, of the necessity for the course of treatments prescribed in his particular case, the patient is now more receptive to the mention of that necessary evil—the probable fee. To the patient's mind, the fee is now based upon concrete considerations of skill, time, materials, individual counsel, and professional concern for his dental health and welfare, rather than upon a few hazy ideas.

For reasons which are very obvious to you all, the further you can extrude yourself from the patient's line of vision, and the more completely you can focus his attention upon the illustrations, the more successful you will be in showing visually what you intend to do for him.

Being convinced that the visual presentation method is indicated in practically every case, it is hard to restrain my enthusiasm for it. Knowing that all of us use it to a greater or lesser extent, let the purpose of this paper be an attempt to confirm the practice, and to encourage its use, and to transmit to you a portion of my enthusiasm for and confidence in this method. You, in turn, I hope, will be able to transmit it to your patients. You must be sold, however, on the logic of visual presentation, or it will be impossible for you to sell your patients through its use.

Salesmanship enters into every transaction in life, and within ethical limits it has a distinct place in the practice of dentistry. Salesmanship even enters into the sacred realm of religion. You will agree that the cleric who persists in using biblical terms and phrases is obsolete. He talks over the heads of the majority, and to those his points are lost. People today demand visual synonyms. You will find that the successful cleric of today inserts a current event, or makes a comparison to an aeroplane, to give his listeners something tangible and modern to visualize and compare—thus making his sermons more interesting and comprehensible. The clergy is now in demand through the intelligent application of salesmanship. In other words, they sell religion by comparison.

Dental salesmanship is, in short, the art of creating a desire to want or to purchase dental service. It does not, however, mean overselling. I do not want you to miss that point. The plan is to show and compare the different types of work you feel apply to the patient's individual case, and not to force anything on the patient. One must guard against letting the patient oversell himself, while showing him the different types of work. The patient, knowing his own financial position best, should be permitted to select from various types of work which you judge to be adequate for his case that one which he knows he can, without too much difficulty, pay for. Observance of this rule should avoid overselling by the dentist and by the patient himself.

When a patient, upon hearing the diagnosis, which has been based upon x-ray findings, feels that he cannot have all his work done at one time because of the amount of expense involved, appeal to him by comparing his dental problem with his insurance problem. If he were buying insurance, he would do so with a definite goal in mind—to educate a child, to provide an old-age income, or to buy a straight life policy, to insure a certain sum of money in case of death. How does he pay for this insurance? Either monthly, semiannually, or annually. He puts so much aside in his monthly budget to take care of it. Why, then, not look at his dentistry bill from the same angle? He has his goal set for him by the diagnosis. If he will put so much aside for dentistry each month, and will then have that much work done, the average patient can soon see his dental objective realized. You will have rendered him a real service by preventing neglect of his teeth, and by suggesting a unique way of paying for it which he probably had not thought of before. I have had the pleasurable experience quite frequently of seeing such a patient become so interested in the progress of his dental plan that somehow he manages to see his goal realized considerably ahead of schedule.

By removing a great deal of the mystery that seems to surround the practice of dentistry, the visual presentation method cannot but serve to increase confidence and good feeling on the part of the patient. It is sound and logical.

In conclusion, let me remind you that these are normal times. The depression is over. Let us get down to hard work. Sell at least the dentistry that comes to your offices. There are many people who are interested in their teeth and health—people with means to pay for dentistry. Do not miss an opportunity to show a patient what can be done for him in dentistry. Who knows but that his apparent disinterest may be only because no one has taken the trouble to explain the possibilities and advantages to him. One patient whom you are successful in making dental conscious may bring one or dozens of patients to you whom you might not have been able to get otherwise. It is a service you owe to your patients. It is not your patients' fault many times that they visit some unethical office. You have talked in terms of hecolite plates, and gold crowns, the same as the unethical man, yet he has named a fee much lower than yours. This will happen less often if every one of you shows your patients visually, and sells service rather than materials.

Make your own scrapbook or models, or any other device, to show your patients what you intend to do for them before you start the case. Talk in lay terms and not over the patient's head. Surely a technic for visual education of your patients, or any other technic, no matter how perfectly conceived, will not work unless it is understood and applied with diagnostic judgment and reasonable sales ability. Dentists are likely to view a clinic or hear a lecture, pronounce it good and attempt to apply it in practice with only an inkling as to what it is all about. Failures often occur. Therefore, it is my plea that no dentist attempt to follow the technic described here until he sells himself, and understands the psychology of the plan and the sequence of the steps necessary to bring definite results.

J. M. Peabody.

Extraction

Dear Dr. Pollock:

In the 1933, March, issue of the *INTERNATIONAL JOURNAL OF ORTHODONTIA*, was published some correspondence relative to a letter from Dr. W. H. Grinnell. Although not named by him, I assume that Dr. Grinnell had me in mind when writing this letter to you relative to the extraction of first permanent molar teeth in the treatment of orthodontic cases. I am, therefore, enclosing a copy of a letter replying to each one of those to whom this letter was addressed, together with a reprint of a paper written by Mary A. McLachlan, of Christchurch Hospital, New Zealand.

In the reply which Dr. B. O. Sippy of Chicago made, he states that he has done an extensive piece of work upon this subject published in the *Journal of the American Dental Association* of November, 1927, the title of which article is "The Effects of the Loss of the First Permanent Molar." In this article Dr. Sippy admits from extensive research that, "considering the literature chronologically from 1856 to the present time, the proportion of arguments for and against are about equal." If this is so, it clearly indicates that the subject is a debatable one. My experience compels me to say that orthodontists, both individually and as a group, have been so intolerant to the thought of this subject that they would brook no approach to the matter.

For a supposedly scientific group not to give fair hearing to any individual who might have some program which would benefit humanity, smacks of a complacent smugness and of hypocrisy of thought based upon fear, intolerance, or dogmatism.

For years, my father and I have made overtures to various dental groups, only to be laughed out of court through the bias of the orthodontists. We have a program which we feel is basically sound. We base our premise on both a biologic and a scientific viewpoint. Our experience has proved that the majority of orthodontists, both individually and as a group, with whom we have come in contact are out of step if not entirely lacking in sympathy toward the humanitarian and social aspect of the orthodontic problems so far as they apply to the masses.

It just seems inconceivable that in 1935 there could be such a lack of interest in the social problems of dentistry, especially as related to orthodontia, as is evidenced on the part of these specialists whose responsibility it is. The fact is, they cannot and will not do anything to assist; rather have they gone to the extreme to handicap those of us who really want to help poor children who cannot afford orthodontic treatment; which, I know, can be done through the medium of judicious extraction of teeth. This, however, does not mean the extraction of all four first permanent molars in all cases, or even as a routine measure. There are men here in the East who are awakening to these responsibilities and considering this method as one of sound economic principle for treatment of orthodontic cases where the common good of thousands of poor children is concerned and who would otherwise remain without its benefit.

It is to be regretted that, as yet, there seems to be no common ground upon which to meet to work out this problem. I do, however, prophesy that the subject is too vital to be allowed to pass unnoticed; that sooner or later the orthodontists, as a specialized group, must give very serious consideration to the social aspects of their specialty.

From my observation and experience, and unless they do have a change of heart, they will be tried, weighed and found wanting, due to a lack of any substantial contribution which they might have made as a group to the thousands of poor children needing the benefit of their services. I trust, therefore, in fairness to me, that you will give my letter the same degree of publicity which was afforded to Dr. Grinnell.

Sincerely yours,

Arthur A. Libby.

Further Comments on the Effects of the Loss of the First Permanent Molar

A short time ago I received a letter from Dr. Arthur A. Libby of Boston with enclosure of a reprint from M. A. McLachlan* supporting Dr. Libby's contention of "judicious" extraction of first permanent molars. In this reprint, the writings of authors from New Zealand, Germany, Australia, Austria, England, Brazil, and Libby of the United States of America are extensively quoted as favoring extraction of first permanent molars. It is worthy of note that these, who advocate extraction, emphasize the importance of the time element governing extraction.

In these quotations, we find the following: "... timing [the extractions], if possible, just previous to the eruption of the second permanent molars." "... remove [the first permanent molars] at the *correct moment* in the development of the jaw." "Always retaining them [the first permanent molars] if possible until the premolars are in occlusion to take the bite. . . ." etc. When one recognizes that the eruption time of teeth has such wide variation in groups of children and such variation in an individual as to the maxillary arch as compared with the mandibular arch, one side of either arch as compared with the opposite side, and in opposite quadrants of opposite arches, it certainly is a far cry to advise "judicious" extraction at "an exact moment," inferring that if the exact moment is not determinable, even with radiographs and all other agents available, disaster to the denture is certain or at least probable. In a large group of cases in which teeth have been extracted, particularly first permanent molars, for any cause, and in which the extractions have occurred at varying ages without space retention,† a careful analysis will show a high percentage of complications as the result of such practice, particularly if reviewed a period of years after such extractions were made.

I would congratulate authors for reporting such observations as McLachlan

*McLachlan, Mary A.: Symmetrical Extraction of the First Permanent Molars, New Zealand Dent. J., September, 1934.

†Sippy, B. O.: The Importance of Space Retention in Maintaining Occlusion, J. A. D. A., September, 1928.

has done in her conclusions* as follows: "The most important definite conclusion I have come to is that . . . even where both upper and lower [first permanent] molars are extracted, the lower 7 has much more difficulty in moving forward in the dense bone of that region than the upper. At any rate, such is the case in most of the models I have. In fact I have been disappointed at finding that a large percentage of lower molars have not moved sufficiently to close the space, with resultant tipping of the 5's and 7's." The facts embodied in the foregoing quotation are unquestionably supported by clinical evidence regardless of whether two opposite molars are extracted or whether all four are extracted, as the same condition occurs on both sides of the arch, as well as on one side, and is in keeping with the findings reported by me in 1927.† It should be remembered that one case or a very small group of selected cases is not the evidence upon which one should rely in this question or any other question under scientific investigation. Nor should one make observations until time has played its unerring part in completing the influence of perverted forces.

Many accidents, unintentional and intentional, occur to growing dentures which, in time, by the wonderful process of that inherent something within the mechanism of the human denture, develop a compensation which produces some kind of a denture; but no one likes the compensation and more often it is viewed with sadness and extreme regret. Such mutilation and resultant compensation must be faced at the maturity of the individual, at which time anxiety and hope have reached their height that something be done to save the wreckage of regrettable procedure long ago. Frequently an orthodontist is faced with such a problem. In some instances a great improvement may be made in occlusion, functions and appearance, but often it is beyond management, and the consequences are too well known.

I wish to cite two cases from my own practice which are outstanding examples. The first patient, a medical student finishing his internship at the Cook County Hospital in Chicago, presented with an extreme malocclusion. After a careful case analysis had been made from orthodontia cast, full mouth radiographs, photographs, and as complete a case history as could be desired, it was found that he had had his first permanent molars "judiciously" extracted at the supposedly "exact moment" to relieve his malocclusion when he was a boy. My conclusions were that I could not undertake the responsibility of management of the malocclusion because of the serious complications (the compensation) which had occurred over the period of years. The patient's reply was as follows: "Either you do this for me or I will have the rest of my teeth extracted and have a full denture made, as I cannot face the world as a physician and undertake the building of a practice as I am." Rather than allow him to carry out his unquestionably sincere threat, the treatment was undertaken. Fortunately, the result was far beyond expectation, but three years of intensive and careful work were required in treatment at a most inopportune time in the patient's life.

*McLachlan, Mary A.: Symmetrical Extraction of the First Permanent Molars, *New Zealand Dent. J.*, September, 1934.

†Sippy, B. O.: The Effects of the Loss of the First Permanent Molar, *J. A. D. A.*, November, 1927.

The second patient was a young woman who had reached maturity disfigured by the compensation resulting from so-called "judicious" extraction of molars when she was a girl. Theoretically and ideally speaking, in the argument of those advocating "judicious" extraction, the spaces should have closed and all was to have been satisfactory. The unfortunate result was that the maxillary second and third molars did as expected, i.e., moved forward, but the maxillary denture continued its forward growth far beyond normal because there was no resistance to stop it since the mandibular second and third molars had stayed where they belonged and the entire mandibular arch had collapsed completely. The result was quite hideous. Of course, orthodontic management was entirely out of the question but, having a desire to help this most unfortunate person out of a difficulty that had been brought upon her, an oral surgeon and a prosthetic dentist of reputation were brought in for consultation. It was finally agreed that even surgical procedure was out of the question, and without surgical reconstruction of the jaws, prosthetic efforts were not possible. The despair of that young woman, knowing that nothing could be done to relieve her mutilation, is something never to be forgotten.

Regardless of how many "good enough" dentures can be shown by those advocating "judicious" extraction, the experience and witnessing of one such case as cited would deter any one, I should think, from such practice. Had he any professional conscience, it would cause him to worry as to how many children whom he had so mutilated had reached maturity with such irreparable complications. Speaking of the "social problems" in relation to dentistry, including orthodontia if one insists, the case just cited should give plenty of food for thought in that direction as this young woman would not have been practically excluded from her usefulness in society if she had not been so mutilated.

Since the publication of the report of my study of the effects of the loss of the first permanent molar,* additional models have been assembled in the undergraduate orthodontia clinic of the University of Illinois. In the past eight years, I have continued my studies of this subject, and I plan, in the near future, to make a complete report which will be a check on the material previously published and also double the number of cases recorded. The observations made thus far support the conclusions drawn in the original report. Lack of time at present will not permit a review of all the literature on this subject since 1927, and it may be that the proportion remains the same. It is hoped that over a period of eight years there has been an increased number in favor of conserving teeth as a result of improved conditions in teaching orthodontia in the dental schools, resulting from increased recognition of the importance of occlusion in the growth and development of the face and jaws of children and scientific observations by members of the profession who are not, as sarcastically cited, theorists and idealists, but who are clear thinking and far seeing in regard to the clinical evidence ever present.

The first permanent molar has long been recognized as the key to occlusion and as the most important tooth of the human denture both functionally and developmentally. As long as there are members of the profession who do not

*Sippy, B. O.: The Effects of the Loss of the First Permanent Molar, J. A. D. A., November, 1927.

make a serious study of occlusion, the influence of the forces governing occlusion, and the importance of such functions in the normal growth and development of the face and jaws of the human race, there will be a controversy on the question of the advisability of the extraction of permanent teeth, particularly the first permanent molar, for the so-called purpose of relieving malocclusion, impacted third molars, dental caries, and other ailments of the human denture. If the increasing group of professional men who are devoting their entire time and study to occlusion and the management of malocclusion are becoming less interested in the so-called "judicious" extraction of permanent teeth, it would seem to be the best evidence that could be cited that the profession is stepping ahead—out of the fog and into the light of a better understanding of the fundamental principles upon which man's denture and all the associated functions are based in respect to normal growth and development of the human mechanism.

Burne O. Sippy.

The Submerged Eighty Per Cent

A statement frequently appears claiming 80 per cent of our population is unable to pay for dental services. This same 80 per cent has the ability to buy new motor cars, radios, and other expensive commodities to the extent of millions. It is argued that they are entitled to them; nevertheless it should be obvious that a revamped sense of values on the part of the general public would reduce the arbitrarily quoted figure of 80 per cent to one considerably lower.

A discussion of the neglected public usually ends with some plan for furnishing lower priced dentistry through some agency or other. The question of just how this can be done without reduced income to the dentist is usually ignored, as is also the additional reduction on account of the expense of the intermediate agency. Some advocates of such a system frankly state that dental fees must be reduced but that the resulting increase in work will keep earnings up. They are the same sociologic experts who claim that the solution of all other economic ills lies in reduced hours and higher wages for other workers, also that prices of commodities should be raised. This was the chief objective of the administration's gold policy. What the effect of this was on the dental profession needs no emphasis here.

It is time for the dental profession to begin fighting back at least to maintain our present position when it is proposed to benefit other classes at our expense. We are among the minority who, taking our reverses without insisting on governmental favors, have managed to extend help to others who were unable or unwilling to help themselves, and now we are to shoulder the blame for the failure of the 80 per cent of our people so to arrange their affairs that they might pay for needed dentistry.

If community credit plans are a help, let us have them; if taxation is needed to furnish dentistry to some, let it come;—but why should we accept a degraded fee schedule until equal economy is forced on others, especially governmental agencies and office holders?

Paul R. Nolting.

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Editorial

A Cross-Section of Proposed Orthodontic Treatment for a Wider Segment of Society in the United States of America

A SYSTEM by which all medical and dental enterprises of a community are coordinated to place health protection within the reach of all persons, and at the same time to assure payment within the ability of the individual for such services as are required, is the ultimate goal of this so-called medical service revolution in the United States. Just how, if at all, orthodontic treatment may be included in this plan is both a complex and a speculative problem.

In the president's address given before the American Society of Orthodontists, in New York in April, President Waugh made some interesting comments pertinent to the practice of orthodontia:

"A fairly recent survey has shown that approximately 20,000 dentists are doing some corrective orthodontics, or, perhaps much better said, attempting the straightening of teeth. About 6 per cent of these stated that they had studied orthodontics after leaving the dental school, which means that 18,800 dentists admitted that without preparation beyond that received in the undergraduate course they are attempting a service for which they were not prepared, as no dental school has ever claimed to qualify all its undergraduates for the practice of orthodontics." Significant was the plea that orthodontic service must follow the trend of the times and be made available for more children, and that general practitioners should be trained to offer efficient service in this department of dentistry.

Of further interest along this same line, Frank Casto, President of the American Dental Association, in a paper given recently before the California State Dental Association, touched on these same points. He indicated that in the future orthodontic service must be made available to the masses, but he definitely admonished that the service must be improved and that every dentist who expects to offer it should avail himself of the proper training to enable him to develop sufficient skill to practice orthodontia intelligently rather than experimentally.

Under present conditions just how this is to be accomplished is a problem. The Curriculum Survey Committee of the American Association of Dental Schools claims that in the future general practitioners should assume much of the responsibility of rendering orthodontic service and that dental schools must meet this obligation by offering more comprehensive courses in the subject. Not so appetizing or impressive to specialists, however, is the statement in the report that orthodontists are partly to blame for the lack of interest in the subject, particularly on the part of the dental profession, because it is pointed out that orthodontists have failed to educate not only the public but also members of their own profession in regard to the value of the prevention and the correction of malocclusion. The report further castigates orthodontists as a group with the crafty jab that they have surrounded their services with an air of mystery which has left the laity, dental students, and even dentists awed and bewildered. In any event, the combination of these observations, released from various sources generally regarded as official, indicates that the dental profession does not know modern orthodontia and that because this is true the specialist is a convenient target for the blame.

There can be no doubt as to the sincere intentions and the purpose of the suggestions of the President of the American Society of Orthodontists and the President of the American Dental Association, both of whom are orthodontists of wide experience. Little can be said other than commendation of the report of the Curriculum Survey Committee of the Association of Dental Schools in regard to its plans. Even the section of the Committee's report in regard to so-called orthodontic mysticism arouses little more than a passing abdominal chuckle among specialists, because although orthodontists may have created an impression of mystery among laymen, physicians with the monkey gland operation did the same thing, and made the front page with it.

In any event, how to train men sufficiently even to make the slightest indentation upon the situation is no plainer now than years ago when Edward H. Angle established his private school of orthodontia because he felt that dental schools were making only a gesture of their teaching of the subject.

The actual extension of orthodontic services to the masses of children at the present time under the combination of circumstances and conditions extant is only a fiction and is far removed from any practical realization. This cannot be accomplished until there have been educated and trained sufficient men with orthodontic talent, and that will require years to accomplish. Furthermore, the economic set-up in treatment is such that it cannot be reconciled with any community health program which might be within the reach of all the people. Under the present circumstances, if the service is extended as advocated by the presidents of dentistry's two foremost organizations, it must begin in dental schools, and this will indeed be a slow process of evolution in teaching.

Now that the Survey Committee of the Association of Dental Schools, however, is advocating much wider orthodontic training for the undergraduate student, ostensibly in order that the graduate may deal intelligently with so-called simple cases of malocclusion; now that it has said that the dental schools must seriously and honestly try to teach this subject and set aside sufficient hours of the curriculum to accomplish the required result; now that this important step has been taken, it will be interesting to see what happens.

If undergraduate education is worked out according to the outline suggested, in many instances it will be necessary to discontinue the old process of teaching a great deal of nothing in general and substitute for this the teaching of something in particular. Unfortunately under present conditions the student is subject to a wide variation in orthodontic curriculums, depending entirely upon the school which he attends. It is possible for the junior, for instance, at the present time in one particular school in the Middle West, to devote an entire semester to the intricacies of craniocephalometric diagnosis, under the tutorage of highly specialized instructors. He also delves into the accompanying cranio-statically arranged photographs and casts which are correlated with myriads of charts and graphs, and this focuses his attention on survey arch predetermination according to geometrical calculation, and so on, ad infinitum.

Some would say that is like the fond mother who determinedly pushes spinach into her two-year-old child whether the child has any appetite for it or not. At any rate the purpose no doubt is served, of stuffing something into something until it is filled with something. Taught to the undergraduate under the sobriquet of science, hobbyhorse courses create fantastic visions which serve to inflate the entire subject with a maze of theory apart from the real problem in hand. Too much of this and the student's mind bursts with confusion like an overinflated balloon.

There are other institutions which in their curriculums make the appliance just as ridiculously important, with only secondary consideration given to important biologic problems and other fundamentals. In still another school appliances are ridiculed as unimportant and really not worth much serious consideration in the study of orthodontia. These various teachings interest the

experienced practitioner because he knows that it still requires a clever technician to correct with skill the average case of malocclusion. Unfortunately the subject has become circumscribed in some pedagogical quarters with a suspicious amount of shadowboxing and hocus-pocus. If it is ever possible to extend orthodontic service to the masses as advocated by the two presidents above referred to and by the Survey Committee, one of the first necessities will be standardized undergraduate instruction in orthodontia.

There is confusion in the question of orthodontic service for wide brackets of people. Not much is to be gained in talking about orthodontic service for the masses until there is some talent to perform this service; in like manner there is very little to be gained in anticipating any outstanding expansion of talent to create the service until there is first some effort made to train such talent, as is done in other departments of dentistry.

H. C. P.

News and Notes

Southern Society of Orthodontists

The fourteenth annual meeting of the Southern Society of Orthodontists has been postponed. It will be held at the Signal Mountain Hotel, Chattanooga, Tenn., on January 27, 28, and 29, 1936.

WILLIAM P. WOOD, JR., Secretary
442 W. Lafayette Street
Tampa, Florida

Southwestern Society of Orthodontists

The fifteenth annual meeting of the Southwestern Society of Orthodontists will be held at the Rice Hotel, Houston, Texas, on October 31, November 1 and 2.

A cordial invitation is extended to all orthodontists and members of the American Society of Orthodontists to attend our session on their way to the meeting of the American Dental Association in New Orleans the following week.

LOUIS S. WINSTON, President
4115 Fannin Street
Houston, Texas

HARRY H. SORRELS, Secretary
Medical Arts Building
Oklahoma City, Okla.

American Society for Promotion of Dentistry for Children

The ninth annual meeting of the American Society for the Promotion of Dentistry for Children will be held at the Roosevelt Hotel, New Orleans, November 4.

A meeting of unusual importance and merit is planned for those interested in dentistry for children.

WALTER T. MCFALL, Secretary & Treasurer
106 Forrest Avenue, N. E.
Atlanta, Georgia

Omicron Kappa Upsilon

There will be a luncheon for members of Omicron Kappa Upsilon at 12 o'clock noon, Wednesday, November 6, at the Roosevelt Hotel, New Orleans. A short program will be provided.

All members who are in attendance at the convention of the American Dental Association are urged to be present.

Dr. F. J. Genre of 6363 St. Charles Avenue is chairman of the local committee.

ABRAM HOFFMAN, Supreme Secretary-Treasurer
311 East Chicago Avenue
Chicago, Illinois

American Dental Assistants Association

The eleventh annual meeting of the American Dental Assistants' Association will be held in New Orleans, Nov. 4-8. Headquarters will be at the Bienville Hotel. For further information address

LUCILE S. HODGE, General Secretary,
401 Medical Arts Building,
Knoxville, Tenn.

Colorado State Board of Dental Examiners

The Colorado State Board of Dental Examiners will not hold a session for applicants in December, 1935. The next examination will be given June 23-27, 1936.

DAVID J. TEPLEY, Sec'y-Treas.
807 Republic Bldg.
Denver, Colo.

Resolution Adopted by the Tennessee State Dental Association

The following resolution was adopted by the Tennessee State Dental Association, May 16, 1935, during the holding of its sixty-eighth annual meeting at Nashville, May 14-16, 1935.

WHEREAS, we are confident that the Board of Trustees of the American Dental Association has given ample study and deliberation to the problem of health insurance, and we believe their conclusions and attitude are based on sound and honest conviction, and

WHEREAS, the unanimous decision of this body on the subject of compulsory health insurance should be accepted as a nation-wide opinion of organized dentistry, and

WHEREAS, the American Dental Association through its Board of Trustees has adopted the following resolution:

"The Board of Trustees of the American Dental Association believes that the enactment of a program of compulsory health insurance administered by the federal government, the governments of the individual states, or by any individual industry, community or similar body, would inevitably lead to the regimentation and lay control of dental practice which would not be in the interest of the public. That a lowering of the standards of dental practice would result is indicated by the evidence from compulsory health insurance legislation in the European countries where it has been in operation for some years, and where it not only has failed to accomplish the measures of alleviation expected of it, but also has seriously impeded practitioners of the healing arts in the performance of their duties and has been a barrier to the further scientific development of the professions. The Board of Trustees commends the House of Delegates of the American Medical Association and approves the action pertaining to compulsory health insurance taken at its meeting February 16, 1935." Now therefore, be it

Resolved, that the Tennessee State Dental Association approves the action of the American Dental Association, and that all District Societies of the Tennessee State Dental Association be so notified.

Old Age Pensions

From the Press Release Service of the American Dental Association, information is secured in regard to the states within the United States that have old age pensions:

Twenty-eight states and two territories of the United States have adopted, so far, some type of an old age pension. In twenty-three states the system is mandatory. In five states it is an optional system depending upon the counties for the acceptance of the act.

STATES THAT HAVE OLD AGE PENSION LAWS

STATE	AMT. PER MONTH	YEARS' RESIDENCY	AVERAGE BEING PAID	NUMBER
Arizona	\$30.00	35 years	\$ 9.01	1,624
California	30.00	15 years	21.16	14,064
Colorado	30.00	15 years	8.59	8,705
Delaware	25.00	5 years	9.75	1,586
Idaho	25.00	10 years	8.85	1,090
Indiana	15.00	15 years	First year in operation	
Iowa	25.00	10 years	Start—July 1, 1935	
Kentucky	20.83	10 years	No funds	—
Maryland	30.00	10 years	29.90	141
Michigan	30.00	10 years	No funds	—
Minnesota	30.00	15 years	13.20	2,055
Montana	25.00	15 years	7.28	1,781
Nebraska	20.00	15 years	No funds	—
Nevada	30.00	15 years	15.00	23
New Jersey	30.00	15 years	12.27	9,015
New York	No maximum	10 years	22.16	51,016
North Dakota	12.50	20 years	No funds	—
Ohio	25.00	15 years	First year in operation	
Oregon	30.00	15 years	No funds	—
Pennsylvania	30.00	15 years	No funds	—
Utah	25.00	15 years	8.56	1,096
Washington	30.00	15 years	Legal difficulties	
West Virginia	30.00	10 years	Not yet accepted	
			Compulsory in 1935	
Wisconsin	30.00	15 years	16.75	1,940
Wyoming	30.00	15 years	10.79	634

Invitation to the Seventh Anniversary of the German Dentists and the Seventy-Second Meeting of the German Association of Dental, Mouth and Jaw Surgery

The seventh anniversary of the German dentists will take place from October 3-6 in Berlin. The chief subject will be *Prosthesis and Dental Technology*. The lectures will be held in the Langenbeck-Virchow-Haus. The scientific program will include the following reports and demonstrations:

- I. *Chief report:* The anatomic and physiologic fundaments of partial dental prosthesis and its practical use.
 1. Supplementary report: The preparation of the partial prosthetic work in relation to the use of the remaining denture.
 2. Supplementary report: The construction of partial prosthetic work.
 3. Supplementary report: The impression for the partial prosthetic work.
- II. *Chief report:* The anatomic and physiologic fundaments of full dentures.
 1. Supplementary report: The practical use of the anatomic and physiologic fundaments of full dentures for the impression.
 2. Supplementary report: The practical use of the anatomic and physiologic fundaments for bite and articulation.
- III. *Chief report:* Nature and aims of the scientific dental technology.
 1. Supplementary report: The rôle of stainless steel in its application to partial and full dental prosthesis.
 2. Supplementary report: The new substitutes for gold and their use.
 3. Supplementary report: The artificial resins as denture material.

Practical demonstrations of the following subjects will be arranged:

1. Crown work with special reference to the ringless method.
2. Bridgework with extensive references to porcelain work.
3. New methods of the porcelain work.
4. The technic for fixation of loosened teeth.
5. New methods of fusing and working-up of alloys.
6. Demonstrations of the general progress of prosthesis.

Especial value is set at this meeting on the demonstrations which will be held in great number at single tables at the University Dental Institute.

At the same time special sessions of the study clubs of German associations of dental, mouth and jaw surgery will be held. For example, the study club of dental anatomy and pathology will hold a joint session with the society for exploration on "Paradentosis" under the title: "Pathogenesis of paradentosis." It is announced especially that the general dental exposition will take place at the same time in all rooms of the "Zoo."

Please send announcements and requests immediately to the office of the *Deutsche Gesellschaft für Zahn-, Mund- und Kieferheilkunde, Berlin-Schlachtensee, Heimstättenstr. 20.*

The German Association of Dental, Mouth and Jaw Surgery.

PROF. DR. SCHRÖDER, President.

Notes of Interest

Dr. Brooks Bell announces the removal of his offices to 834 Medical Arts Bldg., Dallas, Texas.

Dr. Ernest E. Palmatary, formerly associated with Dr. H. G. Tanzey, announces the opening of his office at 205 Balcony Bldg., Country Club Plaza, Kansas City, Mo.

Dr. Francis M. Schneider announces the opening of his office at 1210 Chapel Street, New Haven, Conn.

Dr. Adelbert Fernald, 29 Commonwealth Ave., Boston, Mass., announces that he will be at Andover, Mass. (near Phillips Academy), every Wednesday; and at Exeter, New Hampshire, every Friday. Practice limited to orthodontia.